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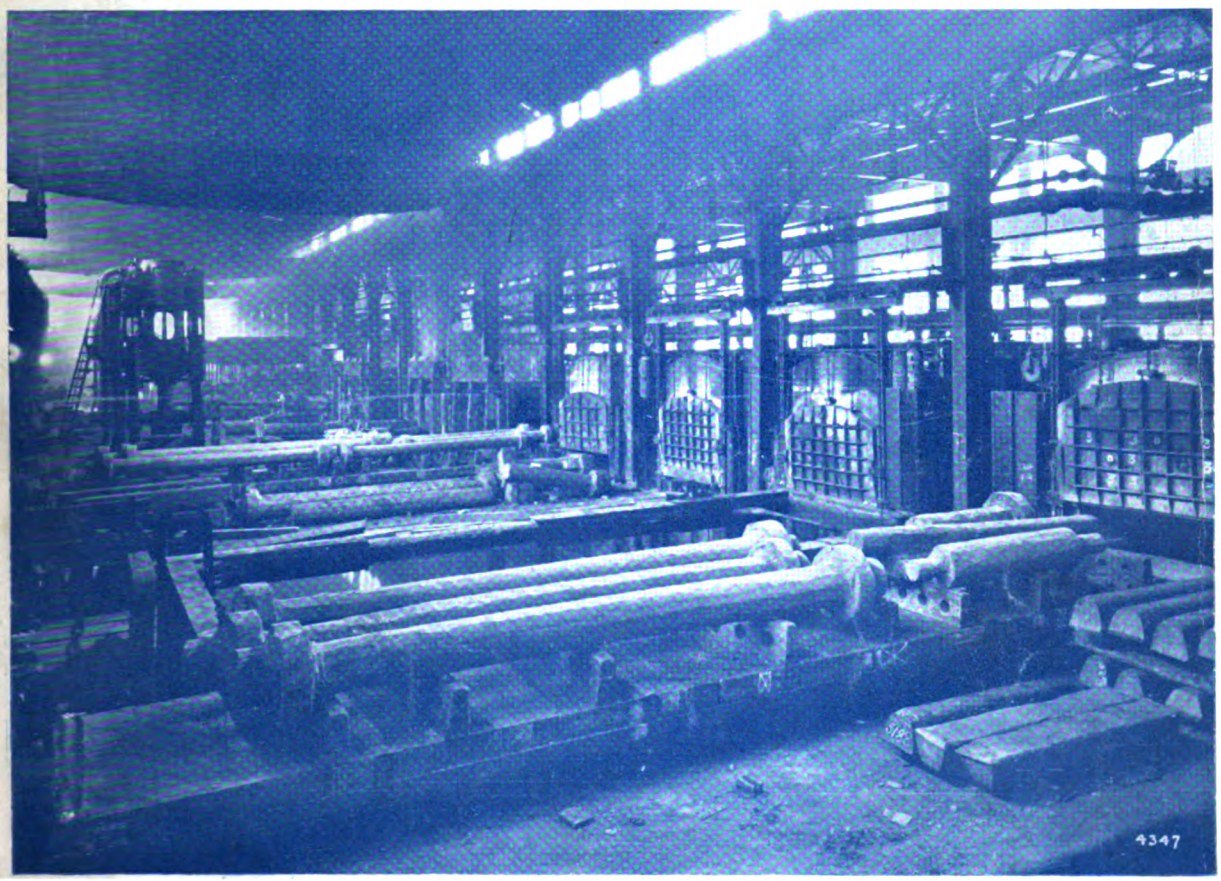

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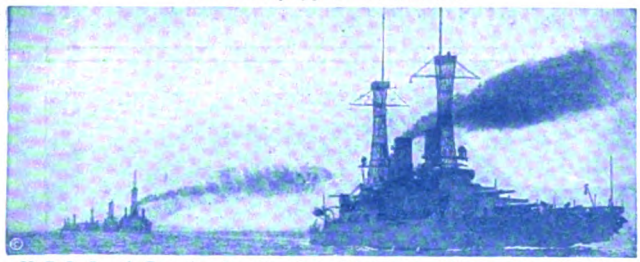

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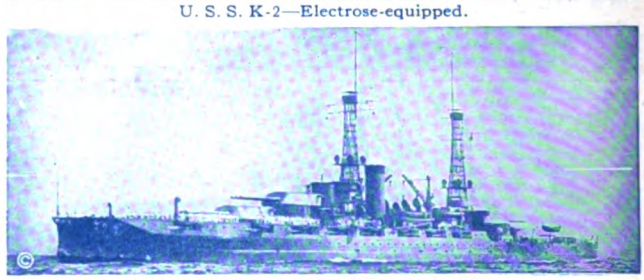

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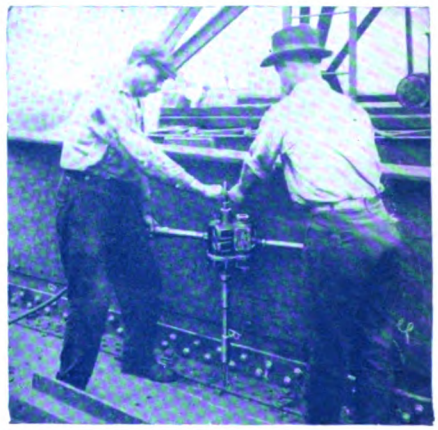

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THE MARINE REVIEW

VOL. 50 NEW YORK MARCH, 1920 CLEVELAND No. 3

Private Operation Meets Test

Only Major Transportation Agency Free of Federal Administration, the Great Lakes Fleet, Sets Remarkable War and Reconstruction Record

AILMENTS of the country's railroads are probably the most serious menace to national industrial health. The fact that the complaint is universally recognized now as anemia, or in other words starvation enforced in years past, is a help but not a quick curative. Relief from federal administration may prove merely a case of discharging from the public hospital a dangerously ill patient who entered the sanitarium with relatively a mild distemper.

Freight carrying agencies on salt water have abundant health compared with the land carriers. Ocean shipping lines are still prospering and cargoes are available on practically all routes. The lack of a clear definition of the administration's policy toward shipping, the vexatious delays in getting the government out of the ship operating field and the international financial disturbances which threaten to curtail exports, are problems comparatively easy to solve when contrasted with those now before railroad executives. It is a case of sufficient shipping and insufficient railroad equipment.

Handling Freight Without a Hitch

Substantial comfort to everybody studying transportation questions comes from an inspection of the work done by the big fleet of freighters operating on the Great Lakes. The annual gathering of the operators of these huge fresh water freighters held at Detroit a few weeks ago served to focus attention on the remarkable record of accomplishment both in time of war and of reconstruction which this important branch of the country's great system of freight transportation has established.

While the lake fleet, of course, suffered no direct losses from enemy acts during the war, it was crippled indirectly and seriously by the necessity for making good such losses in ocean shipping. Practically every useful ship capable of passing through the lake-to-ocean outlet was taken to the Atlantic. This armada of ships numbered 149 steamers, only three or four of which have returned. This fleet had a capacity of 432,400 gross tons.

The lake fleet suffered in still another way in order that ocean shipping might benefit. In 28 months, shipbuilders on the Great Lakes delivered 374 cargo vessels to ocean trades, this representing about 25 per cent of the total number of merchant ships in the entire national program of the Emergency Fleet corporation. In 1919 alone, lake builders sent 215 steamers to salt water. To make this record possible, construction of ships for lake trade was stopped, the only assistance given by the builders being in keeping the fleet in repair. That the lake freight lines were the only carriers free of government administration during the war is evidence of the wisdom of public opinion which has turned away so emphatically from government ownership and operation of either the railroads or the merchant marine.

Confident of Good Business

While the 1919 record of bulk freight movement was less than in each of the three preceding years, the total surpassed that of any other year except 1913 which holds the prewar record. Last year's operations were handi apped by industrial disturbances such as the steel, coal and railroad shopmen strikes. Yet in the face of these handicaps, lower lake docks hold more than the average tonnage of iron ore, demands of the grain trade were fully met and coal shipments exceeded any estimates of the northwest's requirements.

With the opening of the new season only a few weeks away, the lake trade is confident of another good year. Demand for basic commodities throughout the country is so heavy that activity in the iron ore, coal, grain and stone trades is felt to be assured. These four commodities bear such a vital relation to the nation's business that the work of the lake fleet in recent years furnishes an assurance of industrial stability from which everyone in the country will benefit.

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World Charter Market Reviewed by

RATES DECLINE

Entrance of American Vessels in Mediterranean Trade Brings Rate Reduction—Board Sets New Scale

STEAMSHIP companies generally, and American lines especially, have experienced a relatively poor month. The financial drain by reason of the repeated strikes of seamen and dock labor, followed by the coal strikes in England and the United States which curtailed bunker throughout the world, was but a contributing factor. The volume of exports suddenly fell and for a time shipping lines found it difficult to load quickly. The British ports were advertised as congested with shipping and the situation was little better in American ports. For the first time since the war, American lines found it necessary to return freight solicitors to the street in search of cargoes. Gradually the custom of paying fair freight commissions by the lines is being restored. According to reports, foreign ship-brokers have been receiving as high as 7½ per cent for furnishing return cargoes for some American vessels.

Despite this condition, much chartering has been reported during the month. The crux of the trouble appears to have passed, however, as a resumption of cargoes in volume is being reported. The railroad administration has warned the country of a car shortage, which is further evidence that the freight movement is improving. Great Britain has reduced the reserved space on English vessels to 25 per cent, but it has been rumored that this would be increased temporarily, owing to the delays experienced in unloading. The British are desirous of releasing all the tonnage reserved by the government about July 1.

British Have Their Troubles

British ship operators have been having their troubles as well. British seamen have demanded that an 8-hour work day be adopted on all vessels of the merchant marine. It is conceded that the seamens' demand will be granted, thereby placing that labor upon a parity with American labor in this particular. But the English operators have been more perturbed by the announced intention of the shipping board to place the best of the ex-German passenger vessels in service competing with the English lines. The British appear to be unduly aroused over this matter as probably no more tonnage will be placed in the European runs than sufficient to replace the tonnage once run by Germany on these routes.

The delay in selling the ex-German passenger boats is having an injurious effect on American operators, but at least it is giving the shipping board an opportunity to fix some new passenger lines to South America. The Munsons will continue the MOCCASIN in the South American run, this ship having created considerable elation in Rio and Buenos Aires upon her first arrival. Until the HURON can be reconditioned, the MARTHA WASHINGTON will be loaned to this run. The other liners intended for the South American run are the AEOLUS, DE KALB, POCAHONTAS and the PRINCESS MATOIKA. When the shipping board offered the former German vessels for sale, eight American lines and two foreign companies bid for them. The International Mercantile Marine wished to obtain them all. This line would desire to branch out upon a number of new trade routes, could the vessels for them be found. One report stated that the line would engage in the New York to Australia and New Zealand trade.

The Kerr line also wishes to buy the ex-German tonnage from the shipping board. This line has also made offers to Brazil to purchase 26 German vessels interned in Brazilian ports during the war. The German vessels, between 50 and 60 in number, have been chartered to France the charter providing that the French have an option to buy any of the vessels it may desire at the end of one year. Before the Kerr offer can be accepted, the Brazilian government must first ascertain the intention of the French government. The American line is expressing the conviction that their purchase is approximately 90 per cent completed.

Harriman Interests Expand

In American steamship circles, the most important development of the month has been a number of consolidations. Of transcending importance, however, was the announcement that the Sun Shipbuilding Co. has sold the steamer TOLEDO to the American Sugar Refining Co., New York. The sugar company has vessels under charter but previously it had never taken any step toward building up an industrial fleet of its own. The industrial line has been the particular development of the merchant marine under the American flag before the war. W. A. Harriman has rapidly developed into a prominent figure in the shipping field. Following the organization of the Livermore-Dearborn Co. to operate ships, the Harriman interests have acquired the Independent Steamship line, the Shawmut Steamship Co., and the Coastwise Transportation Co. Now, it is reported, Mr. Harriman has acquired the Laphams' interest in the American-Hawaiian line. It is un-

Foreign Claims Heavy

RECOMMENDATION has been made by a committee of the shipping board to award a total of $12,089,149 on claims of foreign shipowners for vessels and material requisitioned during the war. The claims filed numbered 55 and included Norwegians, Russians, Italians, French and Danish. Three were for ships and the remainder for shipbuilding materials. The three for ships were filed by the French, who had filed a total of 32 claims, for which an award of $6,150,643 was suggested. Other claims were: Norwegian, 15 claims, $2,600,000; Russian, two claims, $1,412,532; Italian, two claims, $816,651; Danish, four claims, $1,108,923.

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derstood that Mr. Harriman holds about 50 per cent of the stock of this old company. The Harriman interests are said to be considering the Levant and the Dutch East Indies as logical trades in which to engage. The Green Star Steamship Corp. has effected a combination with the Cosmopolitan Shipping Co., Inc., and Struthers & Dixon, Inc. The lines, operated separately before the combination, will be continued. These include the Green Star lines from New York and Philadelphia to Mediterranean and Black Sea ports, and from Baltimore to the River Plate, Antwerp, Harve, Bordeaux and the Far East; the Cosmopolitan lines from New York to French and Holland ports, also from New Orleans to the Far East; and the Struthers & Dixon lines from San Francisco and Seattle to the Far East. The services out of New Orleans will be increased, and branch offices have been opened in Philadelphia, Baltimore and New Orleans, as well as a traffic office for the western territory in Chicago. The total number of vessels operated by the combine will total approximately 120 first class, ocean-going vessels, with a total deadweight of 1,000,000 tons, which is the largest fleet ever operated under one house flag. The United States Transport Co. has acquired three new cargo ships. This brings the fleet up to 10 vessels.

Plans Important Extensions

Among the new shipping lines incorporated last month were the Matthew-Addy Steamship & Commerce Corp. and the Union Oil Steamship Co. It is reported that the Rio Grande Gulf Steamship Co. has been organized to establish a line of passenger and express steamships between Point Isabel, Tex., and Tampico, Mexico. The Atlantic Fruit Co. has purchased the steamer GLYNDON. The Grace line proposes to place two more passenger vessels in trade between New York and the west coast of South America, making a fortnightly service on this run. The Red Star liners FINLAND and KROONLAND will be returned in about a month to the New York-Southampton-Antwerp service. The American liner ST. PAUL is about reconditioned and will be placed in service shortly. With steamers acquired by allocation from the shipping board, the Seager line expects to obtain the New York-Norway berth. Moore & McCormack will continue in this trade with their own ships. The shipping board has agreed to allocate a fleet of steamers to run between New London, Conn., to London, England. Rogers & Webb are operating shipping board tonnage between Boston and Hull, England. The Raporel Steamship line is planning to inaugurate a passenger service between New York and ports of Haiti and the Windward islands. The New England Maritime Corp. proposes to start a line from Boston to San Francisco.

Manning U. S. Ships

IN ROUND numbers, 266,000 men are required to man the enrolled, licensed and registered vessels of the United States. This tonnage totals 15,325,000 gross. These figures include masters, officers and men. Salt water tonnage is now approximately three-fourths of the total but as it includes relatively large vessels with comparatively smaller crews in proportion to tonnage, the total number of men required to man the salt water ships is estimated at 175,000. In 1914, the total number of masters, officers and men employed on 12,486 United Kingdom merchant vessels was 295,652. Later figures are not available.

LINES EXPAND

Several Lines Consolidate While the Harriman Interests Assume an Important Place in American Shipping

Coastwise steamship lines owned by the railroads will be returned to their owners by the government on March 1. These lines are in no particularly enviable situation in view of the fact they cannot raise their rates without diverting their traffic to the railroads. The Merchants & Miners line will engage in the West Indies trade out of Norfolk, Va. A report has been current, however, that this line is up for sale. Some of the coastwise lines are reputed to be planning the building of new passenger vessels to enable them to run their ships to the West Indies on their coastwise trips.

The Empress Naviera de Cuba has purchased two ex-German freighters from the shipping board and will transfer them to the Cuban flag. The Baltimore-Oceanic Steamship Co. (Italian) has projected a service between Baltimore, Genoa, Naples and the Adriatic. The Societe Maritime et Commerciale de France has purchased the PATHFINDER and is loading her for the Levant. The Francanda line (Compagnie Canadienne Transatlantique) has announced a freight service between Canada and Bordeaux. The White Star-Dominion line proposes a new service from Portland, Me., to the Mediterranean ports.

European Business Falls Off

The entrance of private American lines in the Mediterranean trade has already displayed its effect by forcing a reduction in rates. The shipping board was compelled to put in a new schedule of $1.20 per 100 pounds or 65 cents per cubic foot from Northern Range to Genoa and Naples on general merchandise. Freight forwarders report a decline in European business on account of the drop in exchange but anticipate a heavy movement to the Orient, which will probably result in an increase of rates. Coastwise coal rates from Virginia to New England ports were advanced 75 cents per ton. This coal trade was not considered profitable and the rates were forced up in order to attract some tonnage.

The scarcity of European cargoes during the first part of the month was noticeable. Ships left Atlantic ports with but a half cargo and returned in ballast. Shipments of heavy grain from Northern Range fell

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off, and only occasionally did a steamer leave Canadian or New England ports for the other side. The expectation has been that ships under foreign flags would be chartered to carry wheat to Trieste on the basis of 17 shillings per quarter, and 100 shillings per ton for flour. The demand for coal tonnage has been active, with the expectation that there would be a resumption of export coal soon at $26.50 from Virginia to West Italy, and $25 to Marseilles, subject to the usual turn clause.

Far East Freight Rates Demoralized

Continued demand for lumber tonnage, a heavy movement of freight to the Orient and demoralization of freight rates from the Far East to North Pacific ports are the present outstanding features of the charter market. Lumber exporters are clamoring for carriers to move cargoes, one firm alone seeking space for 30,000,000 feet. The supply of this character of carriers is far less than the demand and no prospect of immediate relief appears as practically all the new vessels built on the Pacific coast are already in service, or chartered. On the Oriental route, the situation is unusual. Vessels are coming in ballast from Japan to obtain return cargoes. The dozen or more new steel steamers, built in Japan for the United States government for delivery on the Pacific coast, have demoralized the eastbound freights which in some instances have dropped to ~~$4 per ton.~~

U. S. Ships are Active in Pacific

Shipping ~~board~~ vessels are handling a large amount of freight from the Philippines and China through North Pacific ports and are leaving on the return with full cargoes of general merchandise. The new 10,600-ton steel steamer ROBIN GRAY, recently built by the Skinner & Eddy Corp., has been chartered by the Pacific Steamship Co. for a voyage to the Orient, to augment the service of this company with shipping board carriers. The ROBIN GRAY, among other cargo, left with 1,500,000 feet of Douglas fir timbers, consigned to China where North Pacific lumber is in urgent demand. With the stabilizing of conditions on the west coast of Mexico, business is being resumed with that territory and several new companies are serving that market with chartered vessels. New firms are also sending extra vessels to Peru and Chile and it appears that the West coast trade from North Pacific ports will form one of the main arteries of trade. The trade with the Hawaiian islands is rapidly resuming its prewar proportions with regular service again established. An immense trade with Siberia is anticipated just as soon as conditions in Russia are stabilized.

Outlook Favorable at Boston

Shipping activity is always expected to increase at this season but the outlook at Boston seems unusually favorable this year. Many new sailings have been added during the past month and others are planned for the early spring. Offerings for South America are increasing and bulk cargoes are available to the extent of the capacity of lines operating to Brazil and the Argentine Republic. On account of the money exchange situation, offerings for France, and in fact for most European countries, are low. Some companies have even had to cancel sailings because exporters were unwilling to take the risk incident to the rapid change in rates. New sailings have been established by the C. H. Sprague & Son Co. between Boston and Scandinavian ports, principally Christiania, Copenhagen and Gothenburg. Three sailings were made during January and the intention is to continue at least two sailings a month throughout the year.

Strikes Hold Ships In Port

American vessels on return trips from Scandinavian ports carry cargoes to British ports. Here they reload with clays, pottery, and general merchandise for Boston. The demand for clothing and miscellaneous goods into Greece, Rumania and Turkey is heavy and sailings to these countries from Boston are continuing regularly. The return trips bring coffee and tobacco from Turkey and iron ore from Spain.

The strike of freight handlers the first part of February tied up several boats in the Boston harbor. The SALUDA, of the International Mercantile Marine Co. arrived recently from New York to secure 18 carloads of breakfast food. She will not be able to load for sometime. The SHICKSHINNY of C. H. Sprague & Son Co., Boston, arrived Jan. 30 from Huelva, Spain, with 2500 tons of iron ore, for Lowell, Mass., and was unable to unload for a week.

Sterling Decline Affects Charters

(From our European Correspondent)

LONDON, Feb. 10. (By Cable.)—Due to the sharp decline in sterling exchange, chartering to the United States is virtually at a standstill. This situation also is reflected in River Plate rates which are extremely weak. In fact, the financial side of chartering is becoming a more effective influence on ship rates, the liberal amount of tonnage in sight at the present time being a secondary consideration. The British government is directing a large number of vessels in the Argentine and Australian trades at new rates which show substantial increases. The rate to Australia is 150s, while the rate to the Plate is 107s 6d. The rate from Cuba to the United Kingdom is 85s. Vessels chartering in that country for United Kingdom ports are bringing sugar of which commodity England is in need. The uncontrolled rate to the Plate is 200s. British owners still face a substantial loss in revenue from the control of tonnage space by the government. Seamen are somewhat more plentiful at United Kingdom ports than they were a month ago but dock labor at London and Glasgow is restive. Congestion at London docks is extremely serious, the average stay in port being about 30 days.

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BIG BOSTON TERMINAL WILL PROMOTE PORT DEVELOPMENT

Airplane view of Boston's $28,000,000 army supply base built as a war emergency—It is now being made ready for private commercial use

CONSTRUCTION of the army base at Boston, one of the chain of seven complete port terminal projects built by the war department to facilitate the movement of materials to France, was started on April 22, 1918. The engineering and architectural details of the base were handled by Fay, Spofford & Thorndike, under the supervision of the construction division of the army, the general contractor being the W. F. Kearns Co. The entire project was completed at a cost of $28,040,000 and turned over to the army transportation service for operation on June 4, 1919.

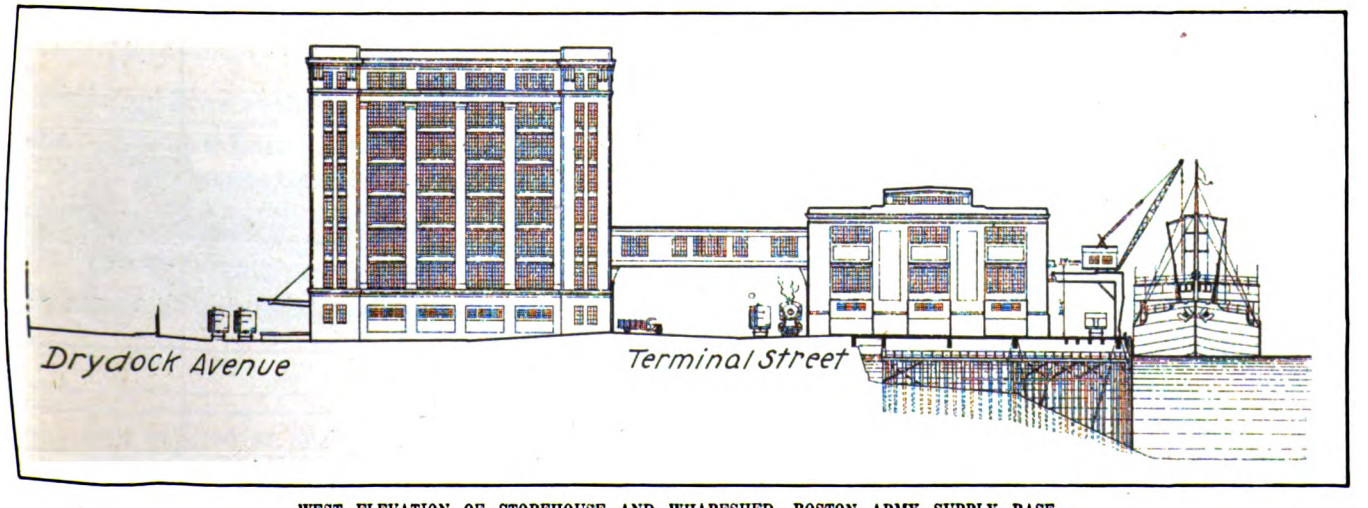
The terminal is located in South Boston, fronting on the south side of a strip of land separating the reserved channel from the main ship channel. The property covers a narrow rectangular piece of ground approximately 550 x 3000 feet, which, with the 1000-foot pier extending east toward the main ship channel, gives the base a total area of 62 acres. From the sea the terminal is accessible by the 35-foot main ship channel and the 30-foot reserved channel, while three main lines of the New York, New Haven & Hartford railroad supply rail transportation service. The principal structures included in the property are an 8-story warehouse, a wharf shed, two pier sheds, power house, electric substation and administration building. A 35-foot concrete wharf, fronting on the reserved channel, constitutes the principal berthing space, supplemented by the 400 x 1000-foot concrete pier extending eastward toward the main ship channel.

Considered Commercial Needs

The terminal was designed for the sole purpose of meeting most efficiently every requirement for the expeditions handling of material originating in the general New England and northwestern territory tributary to the port of Boston, from freight car to ship's hold. While originally planned for handling of military supplies, the probable peacetime commercial utilization of the terminal was also given careful consideration, with the result that the base as completed is ideally adapted for the commercial requirements of the port of Boston for handling both export and import cargo.

The terminal enjoys the flat Boston freight rate to or from points on the New York, New Haven & Hartford or noncompetitive lines. On freight originating at points on other lines, however, a flat switching charge of from 5 to 6½ cents per 100 pounds, carload, is charged. All freight routed for the base is received at the supporting terminal yards immediately northwest of the property. These classification yards were especially constructed to meet the rail traffic requirements of the terminal and have sufficient trackage to handle 800 cars at one time.

From the classification yards, cars may be routed into the terminal and spotted according to the immediate



WEST ELEVATION OF STOREHOUSE AND WHARFSHED, BOSTON ARMY SUPPLY BASE

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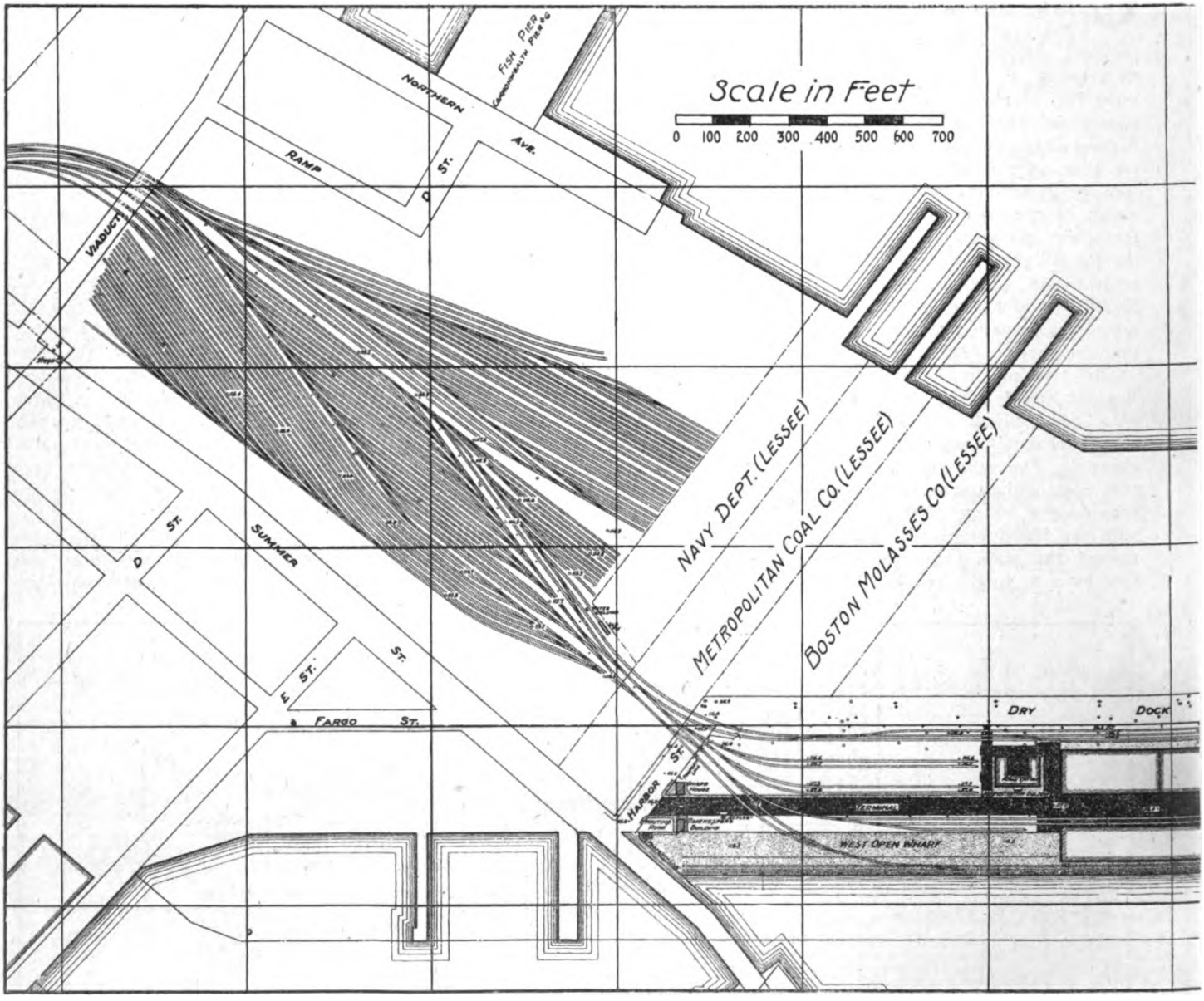
destination of the load. There are 11 railroad tracks within the property, with a total footage of 23,250 and a car capacity of 465. This system is sufficiently flexible to permit the spotting of cars at any desired location on the wharf directly alongside ship, at wharf or pier sheds, at the warehouse, or on temporary storage tracks.

For semipermanent storage purposes, an 8-story reinforced concrete warehouse of modern construction is provided, paralleling the reserved channel and immediately in back of the wharf shed which serves the principal wharf. This storehouse is 1638 feet long by 126 feet wide and contains approximately 1,600,000 square feet of floor area.

Each floor of the storehouse has a gross area of 206,388 square feet, the first floor having wood block and the subsequent floors granolithic pavements. For the vertical transmission of freight within the warehouse, a battery of four automatic freight elevators is provided, each capable of lifting 10,000 pounds at a speed of 100 feet per minute. These elevators are equipped for remote control from the central dispatching station and may be automatically and simultaneously leveled to any particular floor. The only other known installation of this nature for extensive cargo handling is that provided at the army supply base at South Brooklyn, N. Y. Each of these plants has proved entirely practicable, efficient and economical.

The foundation of the storehouse consists of concrete cylinders, one under each column, placed in wells formed by sinking concrete shells, 6 feet in diameter, into the hard clay strata. Thus permanency is assured. The building is provided with the most modern and efficient material-conveying apparatus. The principal features of this equipment are 800 trailer trucks of 2000-pound capacity, equipped with castor wheels for automatically traversing the exact path of the tractor; 40 storage battery tractors, capable of hauling a train of eight fully loaded trailer trucks; 80 trailers, Seattle type, of 5000-pound capacity; six electrically operated vertical tiering machines and five piling machines for stacking bags and similar packages. Two hundred carloads of 6000 tons of freight, destined for storage within the warehouse, may be removed from cars and placed in various parts of the building during a 10-hour working day.

Temporary storage space for loaded cars is provided by trackage on the north of the storehouse as well as



TOPOGRAPHICAL PLAN OF GOVERNMENT PROPERTY ON WHICH THE BOSTON ARMY SUPPLY BASE MODERN PORT DEVELOPMENT WILL AID

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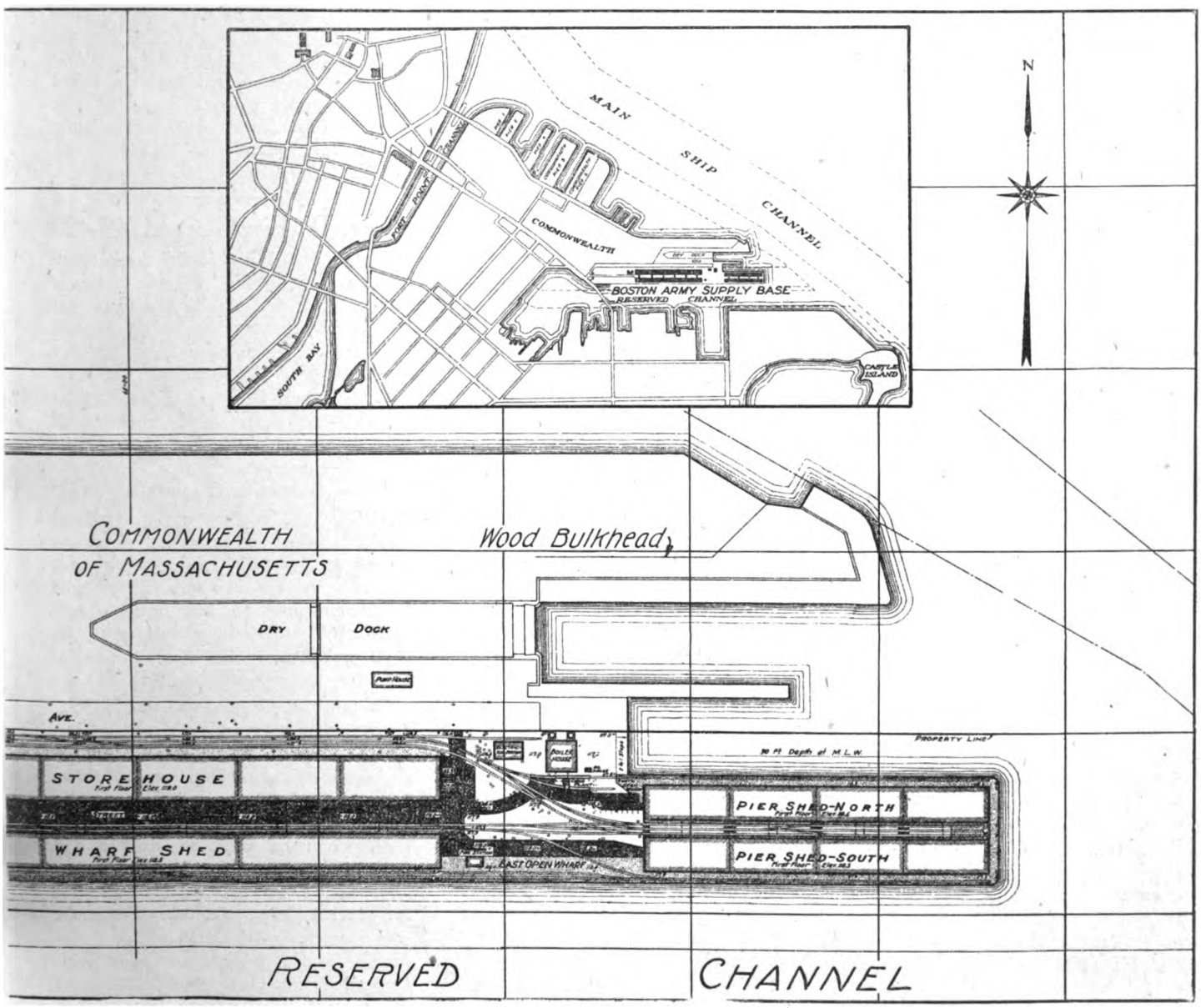
west of the administration building. Facilities are thus offered for temporarily holding freight intact while awaiting arrival of vessels. Freight, either inbound or outgoing, may also be temporarily stored in the wharf shed fronting on the reserved channel, or in the two pier sheds located on the pier extending toward the main ship channel. The total protected storage space is 2,043,863 square feet, with an open storage capacity of 400,240 square feet.

The wharf shed is a 2-story, unheated, structural iron building, paralleling and immediately adjacent to the wharf berthing space, separated by 35 feet from the wharf cap. The deck of the wharf proper which forms the first floor of this building, is designed for a live load of 500 pounds per square foot, the second floor having a supporting capacity of 400 pounds per square foot of floor space. The wharf shed is connected with the main storehouse by six overhead bridges, extending from the second floor, thus permitting cargo assembly of goods in the upper stories of the warehouse and transference to the wharf shed without interference with traffic on Terminal street, this being the open roadway between the two buildings and utilized, in addition to the double railway track on the wharf shed side, for the purpose of receiving and discharging freight by motor truck or dray.

Four electric bridge cranes are installed for the service of the wharf shed and span both tracks on the wharf. These cranes have a lifting capacity of 2½ tons and an operating area of 44 feet from the face of the wharf. They may be used to transfer cargo between the hold of the vessel and the wharf shed balcony, the wharf, or directly into railway cars on the wharf.

The twin pier sheds erected on the pier projecting eastward are three stories high, each 100 x 924 feet, and connected by four elevated bridges. Since some of the ground on which the base is situated was hastily filled, the available area at the time of construction was not sufficient to contain the entire length of these pier sheds. The easterly 100 feet is accordingly built over tidal flats supported by the Raymond type of foundation.

Eight freight elevators with a capacity of 12,000 pounds each at a speed of 50 feet per minute, are provided for vertical transmission. Provision is had between the buildings for three railroad tracks, inclined ramps furnishing access to the ground floor of either shed. Balconies are provided



IS LOCATED. BUILT AT A COST OF $28,000,000 TO MEET THE EMERGENCIES OF WAR, THIS IN REDUCING BOSTON'S PORT CONGESTION

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on the second and third floors of each building on the sides adjoining the water, so that freight may be transferred directly between either floors and ships. The maximum storage area of the pier sheds is 341,000 square feet.

Four steam locomotive cranes are installed for handling bulk cargo; two 15-ton, one 18-ton and one 40-ton capacity. These cranes may be moved at will to any portion of the base for loading or unloading steamers or cars, and for locating freight in the various temporary or semipermanent spaces.

The cargo handling equipment of the base also includes 24 electric dock winches. These are of the portable type and can be used in connection with cargo hoists or to operate ship's gear. Eight of these are provided with remote control apparatus. These winches have a capacity of 2500 pounds at a traversing speed of 225 feet per minute.

The entire wharf covers an expanse of 10 acres of concrete. A continuous wharf cap of 5400 feet long is provided for berthing vessels. Of this 4100 feet represents the berthing frontage on the reserved channel, the remaining 1300 feet serving the pier extension.

All piles were cut at the level of mean low water, or grade 10. The piles were driven in transverse bents on 10.5-foot centers with special clusters under building columns and other concentrated loads. The wharf adjoining the wharf shed is 35 feet wide while the open wharf west of the main building is 120 feet wide, all served by a double track railway and crane rails. The pier shed side wharves each have a net width of 28 feet with single tracks on the north and south sides of the buildings.

Provides Fire Protection

The electric substation is a 54 x 86-foot, single-story building of reinforced concrete. It contains six 13,000-volt transformers and two 500-kilowatt rotary converters, with three switchboards. In the basement are located three motor-driven fire pumps, 100 horsepower each, and a motor generator and electric storage battery equipment for operating remote control switches. The plant transforms the service supply of 13,800-volt alternating current to 2300 volts. This voltage is again reduced at various points of use to 110 volts for light and 220 volts for power. Direct current from 230 to 250 volts is supplied for use in cranes and winches by the rotary 500-kilowatt converters. The powerhouse contains six 400-horsepower heine boilers, each operated by forced draft and using mechanical stokers. The chimneys are twin stacks, 165 feet high and 9 feet in diameter, an overhead bunker feeding coal through automatic weighing machines to the stokers. Ashes are removed by means of a steam jet conveyor to an overhead ash pocket. The structure is 80 x 85 feet, 78 feet high, built on wooden and partly on Raymond concrete piles.

Has Large Capacity

With the proper utilization of all cargo conveying machinery, the capacity of the Boston army supply base is estimated at 13,220 tons or 440 cars per 10-hour working day. These approximate figures represent the amount of freight of all classes which may be moved from the terminal classification yards into either open or closed storage or directly into ship, or vice versa.

According to a statement issued by the Boston chamber of commerce, the port of Boston had for a long time prior to the war been seriously handicapped in its commercial development by inadequate dock facilities. The terminal equipment of the port at the time the army supply base was started was entirely inadequate to at least meet the shipping needs of the army. Within the port were a total of only 17 piers having a mean low water level of 30 feet. Of these, one belonged to the commonwealth of Massachusetts, two to private concerns, and the remaining 14 to the railroad lines feeding Boston. The maximum berthing space of the largest pier was 2800 lineal feet, the average being nearer 1200. It is roughly estimated that the capacity of the new army base at Boston is equal to half the remaining ocean-going terminal facilities of the port.

The original design of the Boston army supply base, as well as those of the other port terminals constructed by the army, was co-ordinated with a gigantic shipping program which, fortunately, it was never necessary to place in operation. The Boston base, in fact, was scarcely half completed when the armistice was signed and the plant was never, therefore, operated to full capacity by the war department. After its completion, it was used principally for the return of troops and supplies from overseas and for temporary storage by both the army and navy.

In accordance with a policy recently announced by Secretary Baker, all of these army supply bases will be turned over for commercial operation as soon as the immediate transportation requirements of the war department and other government agencies will permit. This base will, therefore, be shortly available for private operation under long time lease to the war department, the details of which will insure the government's reimbursement for interest and depreciation, and the future availability of the terminal for military use in case of national emergency.

Boston is now entering an era of shipping expansion which gives every indication of the early commercial utilization of every inch of this excellent terminal. Trade is now being opened up between the New England port and countries which heretofore has operated exclusively to New York, and generally a greater export business was reported during 1919 than in any preceding year. The increased terminal capacity of the port will now make possible a strong bid for the general export trade of the Middle Northwest which previously has had to seek more favorable outlets at other harbors, and will undoubtedly insure for Boston a higher rating in the league of American seaports.

Capt. R. FitzGerald, 48-'20

Capt. Richard FitzGerald, long prominent in lake marine business circles in Ogdensburg, N. Y., died recently at his home in that city. He was 71 years old. Death was the result of an operation he underwent some months ago. During Captain FitzGerald's 63 years as a resident of Ogdensburg he made his mark in the marine business.

Captain FitzGerald was born April 11, 1848, at Glin Castle, County Limerick, Ireland. He attended a private school at Glin and came to America with his mother in 1857. They came to Ogdensburg to live and Captain FitzGerald attended school until the Civil war broke out when he volunteered at the age of 16.

Captain FitzGerald returned to Ogdensburg in 1865 and entered the employ of the Northern Transportation Co. as an officer on its steamers plying between Ogdensburg and Chicago. He remained with this company until 1874, when he went to Buffalo and entered the service of the Anchor line, acting as master in that line for several years. Captain FitzGerald was a master mariner, also Lloyd's inspector and a marine surveyor, with an office in Ogdensburg. He was recognized all over fresh water as an authority on ship construction.

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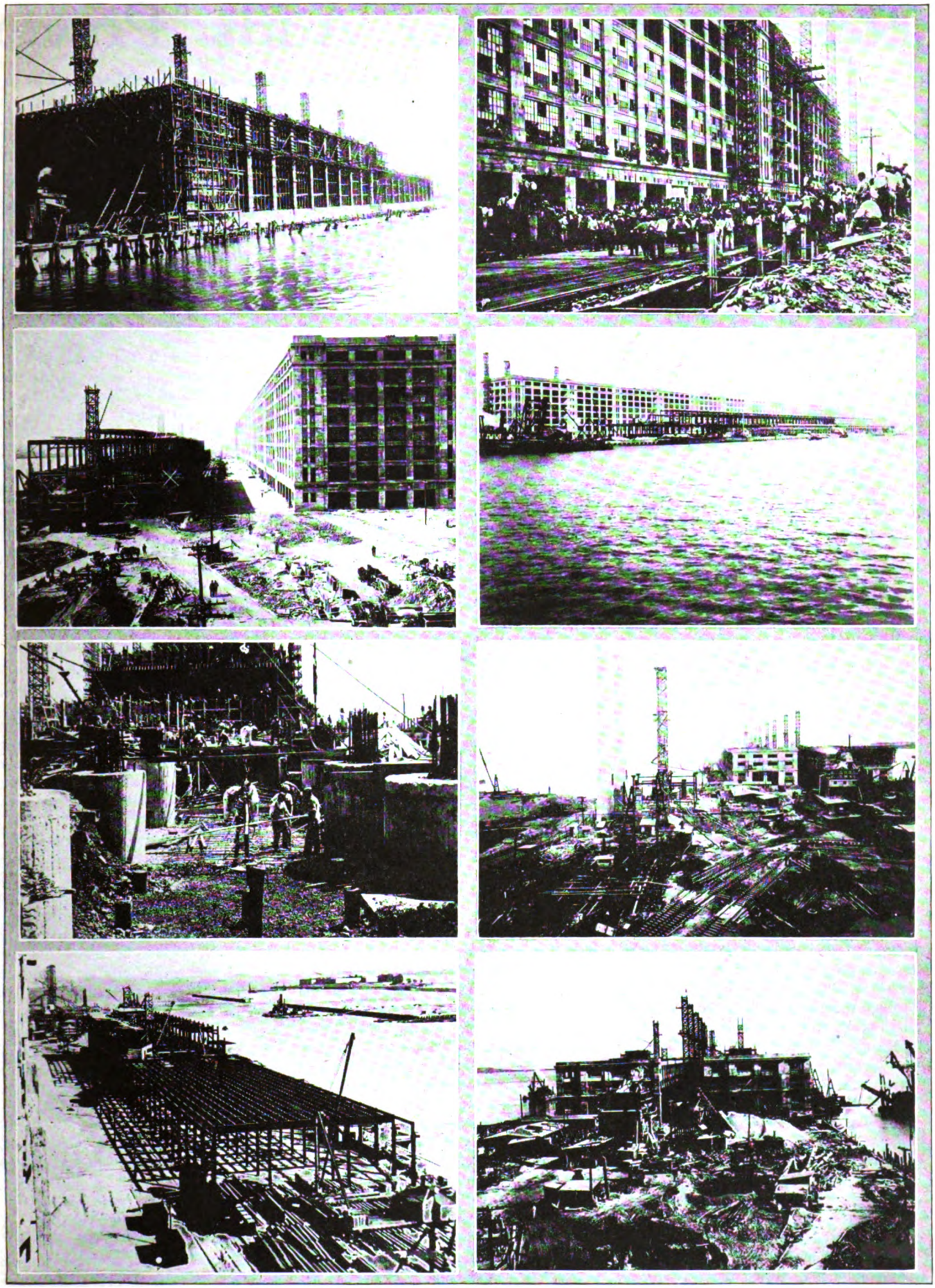

PROGRESS VIEWS OF BOSTON'S ARMY SUPPLY BASE NOW COMPLETE AND READY FOR OPERATION

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New Valve Gear Adds Power

Complete Test Made of Engines Fitted with Poppet Valves Actuated by Modified Walschaert Gear — Operation Noiseless — Substantial Fuel Saving Shown

BY H. PENTON

INTERESTING tests on two similar vessels, each equipped with a triple expansion engine of like horsepower but with different types of valve gear, recently were conducted on the Great Lakes by officers of the United States Shipping Board Emergency Fleet Corp. The vessels, LAKE FARLEY and LAKE FARISTON, were both built by the American Shipbuilding Co., Cleveland. Their dimensions are 251 feet between perpendiculars, 261 feet over all, 43 feet 6 inches beam and 28 feet 4½ inches molded depth. They are designed for a load draft of 24 feet 2½ inches and a deadweight capacity of 4050 tons in salt water. Their loaded displacement is 6048 tons and their contract sea speed is 10 knots. The block coefficient is 0.78 at load draft.

They are equipped with triple-expansion engines with cylinders 21 x 35 x 59 inches diameter with 42-inch stroke and two single ended boilers 14 feet 6 inches diameter, 11 feet 6 inches long for 185 pounds working pressure. Each boiler has three furnaces, 42 inches diameter and 425 tubes 2¾ inches diameter. The boilers are designed for positive heated draft. The total heating surface per boiler is 2733 square feet. The auxiliaries, with the exception of the air pump and two bilge pumps, are all independent and steam driven. Both ships are fitted for oil fuel on the White system. The propelling engines of the LAKE FARISTON are of standard design with stephenson link gear operating a piston valve on the high pressure cylinder and slide valves on the intermediate and low pressure cylinders. The engines on the LAKE FARLEY, however, are fitted with poppet valves, operated through cams by a modified walschaert valve gear.

The object sought in this arrangement was improved economy such as has been attained through the use of such valves in stationary practice, because of superior steam tightness, small clearance volume, and, through the combination of valve gear and cam operation, better control of the valve movement and steam distribution. A collateral advantage lies in the reduction of friction load and reduced wear and tear.

A further development consisted in arranging for diversion of auxiliary exhaust steam to the intermediate receiver and taking steam for the feed water heater from the low pressure receiver. Reheating coils were also fitted to the intermediate and low pressure receivers, the former taking steam at boiler pressure and reducing to 30 pounds for the low pressure coils. These reheaters, while exerting a pronounced influence on the receiver pressures, were found to be extremely costly in operation and have been discarded.

The auxiliary exhausts are arranged to be directed either to the receivers or through the feed water heater at will. When the engines are to be slowed or handled the auxiliary exhausts are first diverted to the heater. The change in back pressure is automatically cared for by a special reducing valve controlling the steam supply. The arrangement of auxiliary exhausts on the LAKE FARISTON is that ordinarily employed, that is, the exhaust steam is led to the heater and then to the condenser through a back-pressure valve.

Both Ships Trimmed Alike

Comparative trials of both ships were attempted in ballast trim over the same course and with as nearly as possible the same observers. Both ships were trimmed with oil-fuel and water to a mean of 10 feet 7 inches and 10 feet 8½ inches for the LAKE FARISTON and LAKE FARLEY, respectively, corresponding to displacement of 2380 and 2410 tons, fresh water. The course in each case was from Cleveland harbor light to Ashtabula and beyond and return, the distance between these two points being used to determine speeds. Effort was made in each case to run the course at 10 knots as nearly as possible but due to unknown variations in the propellers, this was difficult to attain and the data exhibit considerable difference in revolutions.

The LAKE FARISTON made 10.1 knots for 75.3 average revolutions per minute while the LAKE FARLEY made 10.16 knots for 68.16 average revolutions per minute. The LAKE FARISTON'S corresponding average horsepower was 1052.3 and that of the LAKE FARLEY 850.4. The LAKE FARISTON'S oil consumption averaged 189.7 gallons per hour, the LAKE FARLEY 163.8 gallons per hour, or per indicated horsepower for all purposes 1.31 pounds and 1.38 pounds respectively. However, on this trial receiver reheaters were in use but auxiliary exhausts were not turned into receivers. The cost of reheaters will be shown later. There appears here for practically identical speeds, a saving of 14 per cent in oil per hour in favor of the LAKE FARLEY. The weight of auxiliary steam may be assumed to be approximately equal in each case and, therefore, appears to the disadvantage of the ship with the lower power.

An attempt was made to determine the evaporation by metering the feed water and two meters, which were guaranteed by the maker to have been calibrated and tested for the purpose and at the temperatures expected, were installed in tandem as a check but were found on both trials to be so erratic as to be valueless and were discarded and, therefore, no figures as to steam consumption are available since lack of space prevented the use of tanks.

Following the trials referred to, the LAKE FARLEY was loaded with coal for Lake Superior to a mean draft of 19 feet 11 inches, corresponding to displacement of 4790 tons, fresh water.

Trials at 10 knots (11.5 miles) were carried out on Lake Huron and Lake Superior and at 9 knots (10.35 miles) on Lake Superior. Average revolutions per minute between Lake Huron lightship and Thunder Bay island were maintained at 75.06 for a speed of 10.06 knots (11.57 miles) with reheaters in use and auxiliary exhausts in receivers. The average oil consumption was 209.25 gallons (1517 pounds); average indicated horsepower, 1214; oil per hour per indicated horsepower for all purposes, 1.24 pounds. It should be noted that while the average revolutions per minute and speed are as stated, the revolutions and speed steadily increased as deeper water was made so that the last hours of the run showed 10.1 knots and 76 revolutions per minute and high pressure cut-off had to be reduced slightly to maintain the average as desired.

Speeds were checked by bearings and also by the taffrail log which proved accurate. On Lake Superior, between Whitefish point and Copper harbor, speeds and powers were maintained as before and the reheaters cut out. The oil consumption fell to an average of 182 gallons (1319.5 pounds) per hour or 1.08 pounds per indicated horsepower for all purposes. Check observations over 3-hour periods were repeated with

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reheaters in and out so as to make certain of results. The reheaters, then, apparently cost for operation at the speeds and powers noted about 25 gallons (182 pounds) per hour for which no benefit was returned.

By comparison then with the LAKE FARISTON on a basis of consumption per indicated horsepower, the LAKE FARLEY shows a gain of 18 per cent. Since the LAKE FARISTON was not tried in loaded condition, no data as to power are available, but if the observed power in ballast trim is correct, and if only the same increment is added for loaded condition as with the LAKE FARLEY (or 364 horsepower), giving a loaded power for 10 knots of 1416 horsepower, the gain in economy for the FARLEY is 29 per cent.

It must be admitted that there is room for question as to the reason for the difference in apparent powers between two similar ships at practically identical trims and speeds. There is scarcely reason to question the accuracy of the indicator diagrams as they were taken by skilled operators with new and carefully calibrated instruments and the same instruments were used in each case. Some reduction in indicated power by reason of lessened friction due to elimination of slide valves might reasonably be expected but some additional and further reason must be sought. Possibly greater care in erection and better workmanship might account for a part. But it is probable that at least a part of the difference is to be found in the propellers.

Propellers Differ Slightly

Their propellers are 15 feet diameter, solid, four-bladed, with a designed pitch of 13 feet 10 inches. Comparisons of duplicate propellers disclosed differences in pitch of over 10 inches. The LAKE FARISTON'S trial shows a slight apparent slip, under 3 per cent, while the LAKE FARLEY'S light trials show a high negative slip, about 9 per cent in ballast trim, and only about 2.3 per cent apparent, in loaded trim. It seems probable, therefore, that the LAKE FARLEY'S propeller is really in excess of 15 feet actual pitch, although all the information so far available as to this design of ship from various builders, indicates existence of negative slip or in other words a high wake factor.

If this be true, then, instead of adding 364 indicated horsepower to the LAKE FARISTON for loaded condition, the increment should be more nearly in proportion to the actual differences in powers in ballast condition and the FARLEY'S gain in economy would be still greater.

There remains to be considered certain further indeterminate quantities. The extra feed on the LAKE FARLEY was extraordinarily large, requiring about 1½ turns of a 1-inch valve, average opening, to maintain water levels, while on the LAKE FARISTON the extra feed was quite normal and only used occasionally and in slight amount. This was due to leakages at various points, such as the deck steam lines, whistle valve, sundry leaks at relief valves, stuffing boxes, etc., augmenting the fuel consumption accordingly. During the whole of the trials on Lake Huron and Lake Superior, the steam heating system all over the ship was in constant use and on Lake Superior the weather was cold and the ship was badly iced. The low temperature of circulation water, 44-45 degrees Fahr., caused a low

H. PENTON

hot well temperature. In fact it was difficult to run the circulator slowly enough to keep the hot well above 90 degrees, so that, in turn, the feed line temperatures did not average much above 200 degrees when reheaters were cut out and low pressure receiver pressures fell in consequence. The sum of these losses is impossible of estimation but they will safely bring the fuel consumption within 1 pound per horsepower per hour.

A further check upon the powers at 10 knots is found in a series of observations at 9 knots. These were primarily to determine the comparative power costs at 9 knots and 10 knots. The indicated horsepower for 9 knots averaged 821 and oil 160 gallons (1160 pounds) or 1.41 pounds per horsepower per hour for all purposes. The influence of auxiliaries on the fuel and water rate is here brought out strongly. The amounts chargeable to auxiliaries and heating are practically the same as at 10 knots and are, therefore, a larger proportion of the total. The main engines also are working at lower efficiency, in fact at little over half of full duty and the cost per horsepower, therefore, is just what might be expected. The ships are largely overpowered for their economical speed. There is no reason to doubt that with engines of the same design properly proportioned to a 9-knot speed and with other conditions as suggested later the fuel (oil) expenditure can be maintained at or under 1 pound per horsepower hour which would bring the 9-knot consumption to about 113 gallons per hour as against 167 gallons for 10 knots. For 5000 miles steaming radius, therefore, the increase in deadweight capacity derived from reduced fuel alone amounts to over 100 tons. A further increase in deadweight would accrue from reduced weights of engines and boilers estimated at 45 tons. An increase in cubic capacity of about 3500 cubic feet would accrue from reduction in tank capacity.

Determine Oil Consumption

The oil consumption of both ships was determined by actual volumetric measurement in calibrated tanks arranged for filling and emptying by synchronous valves. The meters in the oil fuel system were compared as to readings with the tanks but proved utterly unreliable and almost without exception the readings were too low, in some instances as much as 25 to 27 per cent. The same conditions were found on the LAKE FARISTON'S trials, the meter error averaging about 14 per cent below the tank measurement. Figures based upon meter measurement, therefore, should be accepted with extreme reservation.

Natural draft was employed throughout. The liberal boiler capacity for the powers developed made mechanical draft not only unnecessary but inadvisable since the uptake temperatures never exceeded 460 degrees and the gain from reducing these temperatures by employing mechanical draft proved unequal to the steam consumption of the fan.

The White oil fuel system is installed in both ships and 52-millimeter burners proved ample for easy steaming.

The auxiliaries in use during trials consisted of: Circulating pump, feed pump, oil pump, general service pump, sanitary pump, and electric lighting set with an average output of 40-50 amperes and 110 volts, steering engine and a refrigerating plant, 1 ton capacity, one-half time. These gave no trouble.

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The engine on the LAKE FARLEY, in respect of arrangement of cylinders, valves and valve gear and of utilizing auxiliary steam, was designed by H. Penton and E. T. Sederholm, district manager and district plant engineer respectively, Great Lakes district, Emergency Fleet corporation. The Emergency Fleet corporation agreed to assume the cost of the experiment and work on the designs was begun in March, 1919, but due to the limited time its sponsors were able to devote to it, construction necessarily proceeded slowly and the ship was only in readiness for first sea trial on Oct. 23. The loaded trials were conducted Oct. 26, 27 and 28. Figures as to comparative engine costs are not complete at present but are sufficiently so to show that the cost is safely within the sum estimated. The design is somewhat more expensive than the standard type, even when allowances are made for standardization to the same basis as the ordinary design but not greatly so. The experience gained suggests many details where construction cost may be reduced, but the designers preferred to follow conservative lines in this installation rather than make special effort toward low cost, in view of the experimental nature of the task.

The valve gear throughout functioned perfectly and noiselessly. The steam and exhaust valves and their cam movements were supplied by the Nordberg Mfg. Co. and followed that company's special design as employed in stationary engine practice, those for low pressure being an enlargement of any previously made. The character of the workmanship on these valves and movements is of the highest order.

The experiment, therefore, may be said to be successful and has effectually justified itself. For ships on long voyages in particular it constitutes a distinct advance in marine engineering. The overall improvement in economy includes, besides fuel, an easy reduction in boiler capacity and consequent investment and maintenance, and also the increase in deadweight and cubic space and attendant increase in earnings. Maintenance charges as to the engine ought to be materially reduced since the gear is practically frictionless, and there are no reciprocating weights of any consequence.

The designers firmly believe that with properly tight work and the number of steam driven auxiliaries reduced to lowest terms, ships of ordinary size and power may be expected to reach an economy of 0.9 pound per indicated horsepower or less for all purposes.

Further reports relative to the LAKE FARLEY'S performance at sea after she had been taken to tidewater, show a material improvement, fully bearing out the designer's expectations as indicated above. This is due principally to stoppage of leaks and to some extent also to gradual improvement in operating conditions.

Such figures as have been received indicate a fuel consumption of between 0.8 and 0.9 pound per horsepower hour for all purposes. A further interesting development is in the behavior of the valve gear during a heavy storm at sea with the vessel in ballast trim and the engines racing badly, the gear is reported as being absolutely noiseless and functioning perfectly at all times without the slightest apparent strain.

A striking feature of the design is found in the quick response of the engine to "stand by" signals. Due to the absence of slide valves with their attendant drag and friction, the engine requires almost no preparation and moves off silently and easily. The design simplifies the cylinders to simple barrels with no extensive chests, receivers and passages, the poppet valve chests being merely bolted to short nozzles. The clearance volumes, as compared with the ordinary design, are merely fractional and the valve movement permits of the use, without loss, of much higher steam and exhaust velocities than are ordinarly employed.

Delivers Ship for Private Account

BY V. G. IDEN

A VESSEL of 7800 deadweight tons the first contracted for and built in an American yard for the private account of an American steamship line since the armistice, was completed by the Downey Shipbuilding Corp., New York, during January. The vessel is the CLARKSBURG, owned by the Coastwise Transportation Co., Boston.

The ship is a 2-deck type steamship with full equipment for a cargo vessel. She has a single screw, straight stem, elliptical stern, and is schooner rigged with two steel pole masts. She has two decks, a raised forecastle, a long bridge and a full poop. A steel deckhouse for officers' quarters has been placed at the forward end of the bridge and on top of this is a wood pilot house. The flying bridge is on a level with the top of the pilot house.

The CLARKSBURG'S measurements are: Length overall 369 feet, length between perpendiculars 381 feet, molded beam 52 feet, depth at side to upper deck 30 feet, and loaded draft 23 feet 6 inches.

She is equipped with an upright, inverted-type, triple-expansion engine with cylinders, 24 x 40 x 70 inches bore with 48-inch stroke. Her engines are designed to develop 2500 indicated horsepower. Her three boilers are of the Scotch marine type, 12 feet long x 14 feet 2 inches diameter. They are arranged for burning oil. Her contract speed is 10½ knots.

Ships Built Rapidly

CLARKSBURG, first vessel to be built for private account since the armistice was signed, is but a forerunner of what American yards can do toward replenishing the world's depleted tonnage. The war taught American shipbuilders many valuable lessons. One was speed in construction so that now, even in spite of the fact that foreign yards are making stupendous efforts to deliver tonnage, it will be many years before they are in a position to build ships as fast as they can be be constructed on this side of the water.

The double bottom is subdivided into six compartments. The compartments under holds Nos. 1, 2, 3 and 4 carry fuel oil and the compartments under the machinery space will carry feed water. Six watertight bulkheads extend to the upper deck. The machinery is located amidships.

Cargo hatches Nos. 2, 3 and 4 measure 26 feet 8 inches by 17 feet 10 inches, sufficiently commodious to accommodate almost any freight that may be offered the vessel. Cargo hatch No. 1 measures 24 feet 4 inches by 17 feet 10 inches and hatch No. 5, the bridge deck hatch, measures 17 feet 10 inches by 11 feet 3 inches. Each main hatch on the upper deck is served by two 5-ton booms and the bridge deck hatch by two 1½-ton booms.

The CLARKSBURG has 381,530 cubic feet of hold capacity. She is rated as having a capacity of 4566 tons under decks, but measures 5313 gross and 3371 net tons. Her tanks are capable of holding 828 tons of fuel oil and 186

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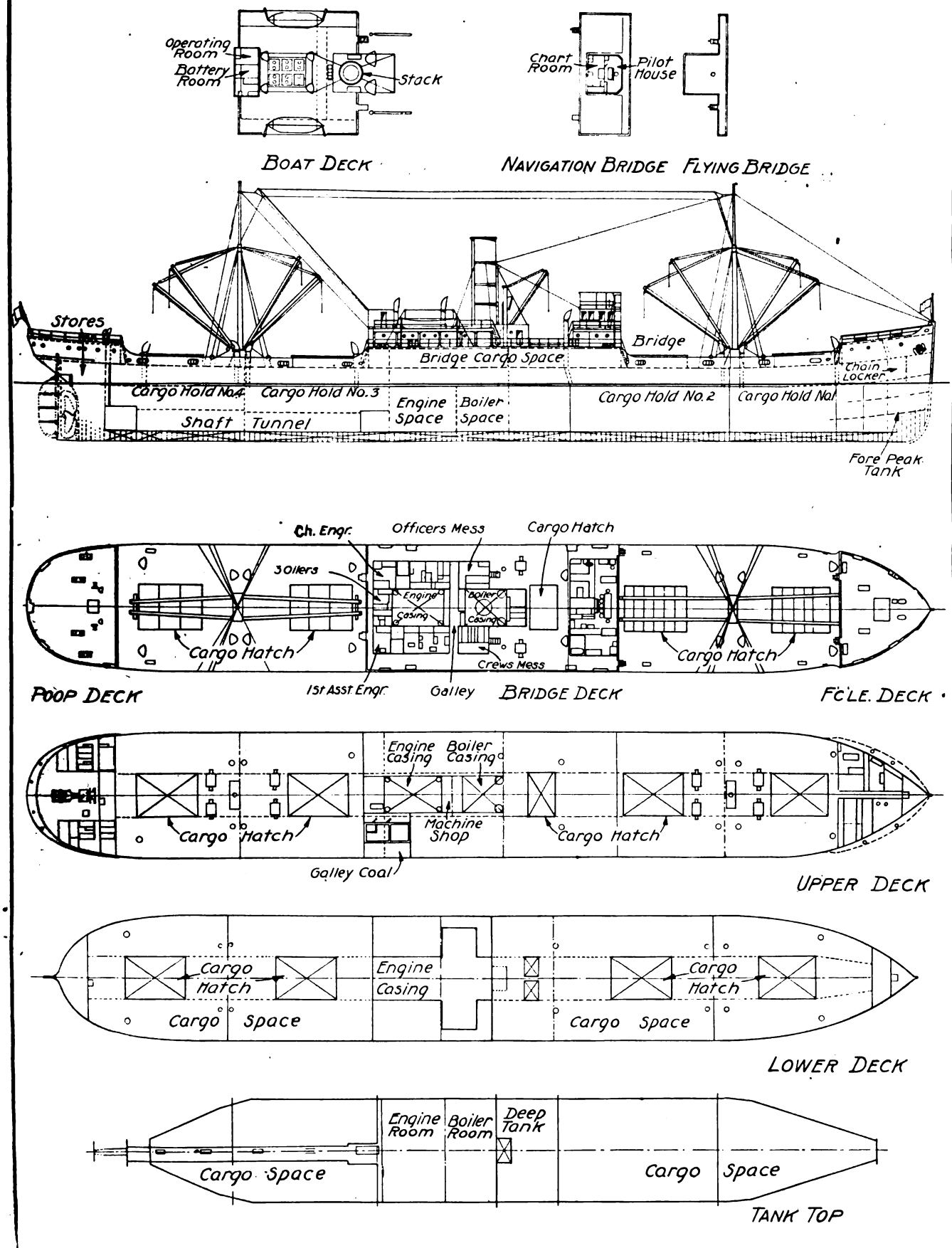

OUTBOARD PROFILE AND DECK PLANS OF 7800-TON STEAMER CLARKSBURG, FIRST VESSEL CONTRACTED FOR PRIVATE ACCOUNT SINCE THE WAR

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TANK CAPACITIES IN TONS				
TANK	LOCATION	S.W.	F.W.	OIL
TANK #1	FR 10 TO 40	184		161
" 2	40 TO 71	262		247
" 3	71 TO 83	109		96
" 4 FEED WATER	84 TO 105		106	
" 5	106 TO 134	253		223
6	134 TO 150	82		72
DEEP TANK	71 TO 83	673		
SETTLING TANK				29
FORE PEAK TANK	STEM TO FRD	100		
AFTER PEAK TANK	FR 161 TO 170	40		
TOTAL		1739	106	828
TONNAGE PARTICULARS				
UNDER DECKS (APPROXIMATE)				4666
GROSS (")				5313
NET (")				3371

HOLD CAPACITIES	
LOCATION	NET CU.FT.
HOLD #1	481700
2	506640
3	496800
4	354600
TWEEN DECKS #1	306600
" " 2	434000
" " 3	510800
" " 4	239700
" OVER MACHY	147200
BRIDGE	533900
TOTAL CARGO CAP.	3017530

NOTE NET CAPACITY CALCULATED TO TOP OF BEAM INSIDE OF BATTENS & TANK TOP CEILING

DISPL'T S.W.	DRAFT	DEAD WEIGHT	FREE BOARD
10005		7029	6-6
	23	7550	7-3
10000	22	7074	6-3
	21	6564	9-3
9000	20	6004	10-3
	19	5504	11-3
8000	18	5104	12-3
	17	4534	13-3
7000	16	4124	14-3
	15	3644	15-3
6000	14	3164	16-3
	13	2604	17-3
	12	2204	18-3
5000	11	1724	19-3
	10	1254	20-3
4000	9	0042	21-3
	8	3342	22-3
3000	7	0	23-3

DIMENSIONS

LENGTH BP	381'-0"
LENGTH OVERALL	395'-0"
BREADTH MOLDED	52'-0"
DEPTH MOLDED TO UPPER DK	30'-0"
" " " BRIDGE DK	37'-6"
DRAFT LOADED	23'-7"

NUMERALS

LENGTH	381'-0" FT
BREADTH	52'-0"
DEPTH	30'-0"
"d"	17'-5"

AMERICAN BUREAU

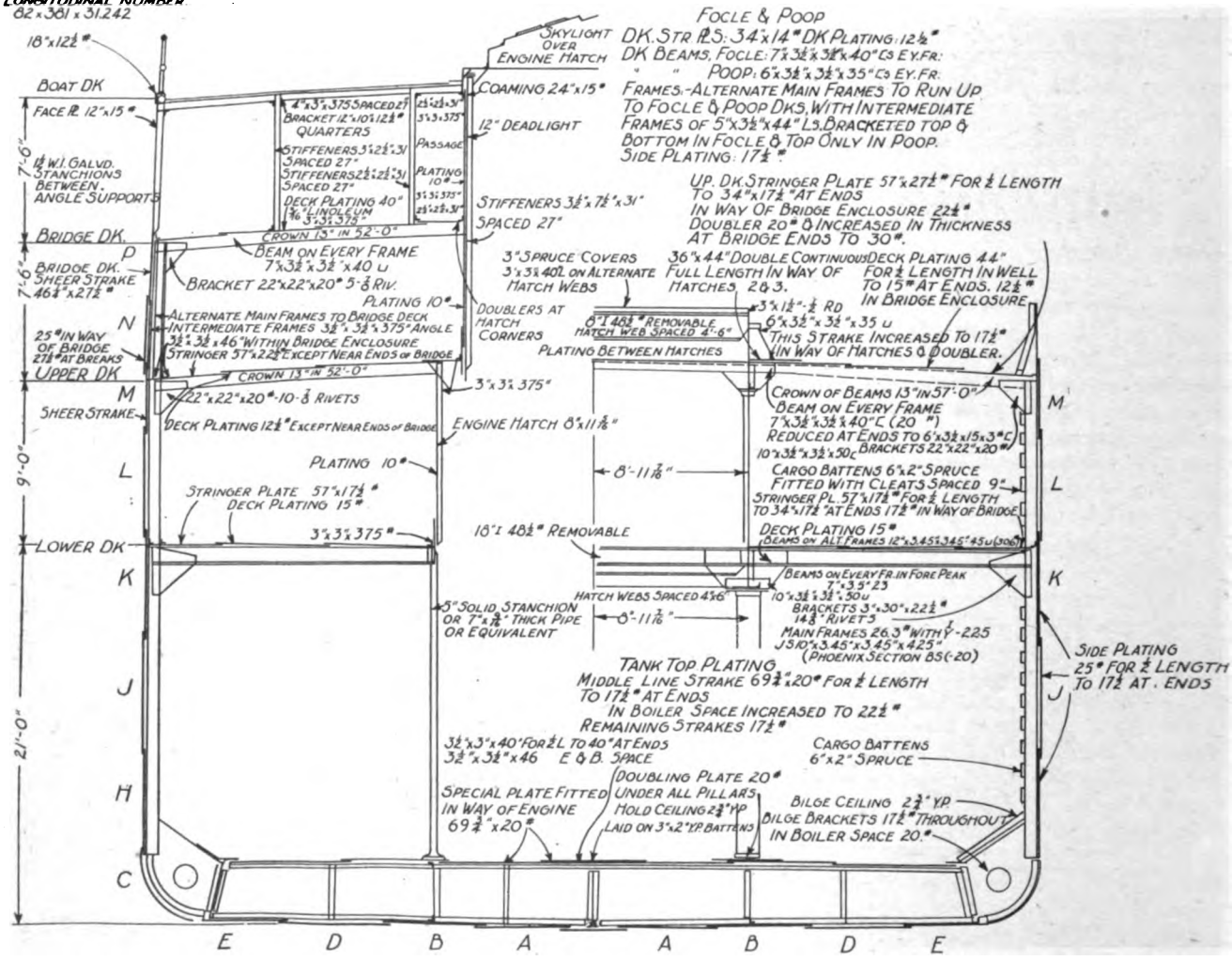
L : LENGTH	380'-0"
B : BREADTH	52'-0"
D : DEPTH	30'-0"
d : DRAFT	23'-4½"

TRANSVERSE NUMBER
BREADTH 52 FT.
DEPTH 30
82

LONGITUDINAL NUMBER
82 x 381 x 31.242

EQUIPMENT

2	BOWER ANCHORS EACH	7070 #	STOCKLESS
1	" ANCHOR.	6020 #	" "
1	STREAM	2590 #	" "
1	KEDGE	1050 #	" "
270	FATHOMS 2⅜" STUD LINK CHAIN CABLE		
90	" 1¾" STREAM CHAIN OR 4½" WIRE ROPE		
120	" 14" HEMP TOWLINE OR 4½" STEEL WIRE		
2	HAWSERS OR WARPS EACH 30 FATHOMS OF 6½" HEMP		
2	" " " " " 7½" "		


FOCLE & POOP
DK. STR 125: 34"x14" DK PLATING 12½"
DK BEAMS, FOCLE: 7"x3½"x3½"x40" C3 EY. FR:
" " POOP: 6"x3½"x3½"x35" C3 EY. FR:
FRAMES.-ALTERNATE MAIN FRAMES TO RUN UP TO FOCLE & POOP DKS, WITH INTERMEDIATE FRAMES OF 5"x3½"x44" L3. BRACKETED TOP & BOTTOM IN FOCLE & TOP ONLY IN POOP.
SIDE PLATING: 17½"
UP. DK. STRINGER PLATE 57"x27½" FOR ½ LENGTH TO 34"x17½" AT ENDS IN WAY OF BRIDGE ENCLOSURE 22½" DOUBLER 20" & INCREASED IN THICKNESS AT BRIDGE ENDS TO 30".
SKYLIGHT OVER ENGINE HATCH
COAMING 24"x15"
12" DEADLIGHT
18"x12½"
BOAT DK
FACE PL 12"x15"
7'-6"
½" W.I. GALVD. STANCHIONS BETWEEN ANGLE SUPPORTS
BRIDGE DK
P
BRIDGE DK. SHEER STRAKE 46½"x27½"
7'-6"
N
25" IN WAY OF BRIDGE 27½" AT BREAKS
UPPER DK
M
SHEER STRAKE
L
9'-0"
LOWER DK
K
J
H
C
21'-0"
4"x3"x.375 SPACED 27" BRACKET 12"x10"x12½" QUARTERS
STIFFENERS 3½"x2½"x.31 SPACED 27"
STIFFENERS 2½"x2½"x.31 SPACED 27"
DECK PLATING 40" ⅜" LINOLEUM
CROWN 15" IN 52'-0"
BEAM ON EVERY FRAME 7"x3½"x3½"x40 U
BRACKET 22"x22"x20" 5-⅞ RIV.
PLATING 10"
ALTERNATE MAIN FRAMES TO BRIDGE DECK INTERMEDIATE FRAMES 3½"x3½"x.375" ANGLE 3½"x3½"x46" WITHIN BRIDGE ENCLOSURE
STRINGER 57"x22½" EXCEPT NEAR ENDS OF BRIDGE
CROWN 13" IN 52'-0"
22"x22"x20"-10-⅞ RIVETS
DECK PLATING 12½" EXCEPT NEAR ENDS OF BRIDGE
PLATING 10"
STRINGER PLATE 57"x17½" DECK PLATING 15"
3"x3"x.375"
LOWER DK
5" SOLID STANCHION OR 7" x ⅜" THICK PIPE OR EQUIVALENT
TANK TOP PLATING
MIDDLE LINE STRAKE 69½"x20" FOR ½ LENGTH TO 17½" AT ENDS
IN BOILER SPACE INCREASED TO 22½"
REMAINING STRAKES 17½"
3½"x3"x.40" FOR ½ L TO 40" AT ENDS
3½"x3½"x46 E & B. SPACE
SPECIAL PLATE FITTED IN WAY OF ENGINE 69½"x20"
DOUBLING PLATE 20" UNDER ALL PILLARS
HOLD CEILING 2½" Y.P. LAID ON 3"x2" Y.P. BATTENS
3"x3"x.375"
PASSAGE
PLATING 10"
STIFFENERS 3½"x7½"x.31" SPACED 27"
3" SPRUCE COVERS 3"x3"x40" ON ALTERNATE HATCH WEBS
DOUBLERS AT HATCH CORNERS
PLATING BETWEEN HATCHES
8'-1 48½" REMOVABLE HATCH WEB SPACED 4'-6"
36"x44" DOUBLE CONTINUOUS FULL LENGTH IN WAY OF HATCHES 2 & 3.
DECK PLATING 44" FOR ½ LENGTH IN WELL TO 15" AT ENDS. 12½" IN BRIDGE ENCLOSURE
3"x1½"-½ RD
6"x3½"x3½"x.35 U
THIS STRAKE INCREASED TO 17½" IN WAY OF HATCHES & DOUBLER.
ENGINE HATCH 8'x11⅞"
8'-11⅞"
18'-1 48½" REMOVABLE
HATCH WEBS SPACED 4'6"
8'-11⅞"
CROWN OF BEAMS 13" IN 57'-0"
BEAM ON EVERY FRAME 7"x3½"x3½"x40"C (20 #) REDUCED AT ENDS TO 6"x3½"x15"x3"C
10"x3½"x3½"x50C BRACKETS 22"x22"x20#
CARGO BATTENS 6"x2" SPRUCE FITTED WITH CLEATS SPACED 9"
STRINGER PL. 57"x17½" FOR ½ LENGTH TO 34"x17½" AT ENDS 17½" IN WAY OF BRIDGE
DECK PLATING 15" (BEAMS ON ALT FRAMES 12"x3.45#x345"x45u(306))
BEAMS ON EVERY FR. IN FORE PEAK 7"x3.5"x23
10"x3½"x3½"x30u BRACKETS 3"x30"x22½" 14-⅞" RIVETS
MAIN FRAMES 26.3" WITH Y-225 J5 10"x3.45"x3.45"x425" (PHOENIX SECTION 85(-20)
SIDE PLATING 25" FOR ½ LENGTH TO 17½ AT ENDS
CARGO BATTENS 6"x2" SPRUCE
BILGE CEILING 2½" Y.P.
BILGE BRACKETS 17½" THROUGHOUT IN BOILER SPACE 20".
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SECTIONS AT ENGINE SPACE AND CARGO HOLDS AND SPECIFICATIONAL DATA OF 7800-TON DEADWEIGHT STEAMER CLARKSBURG

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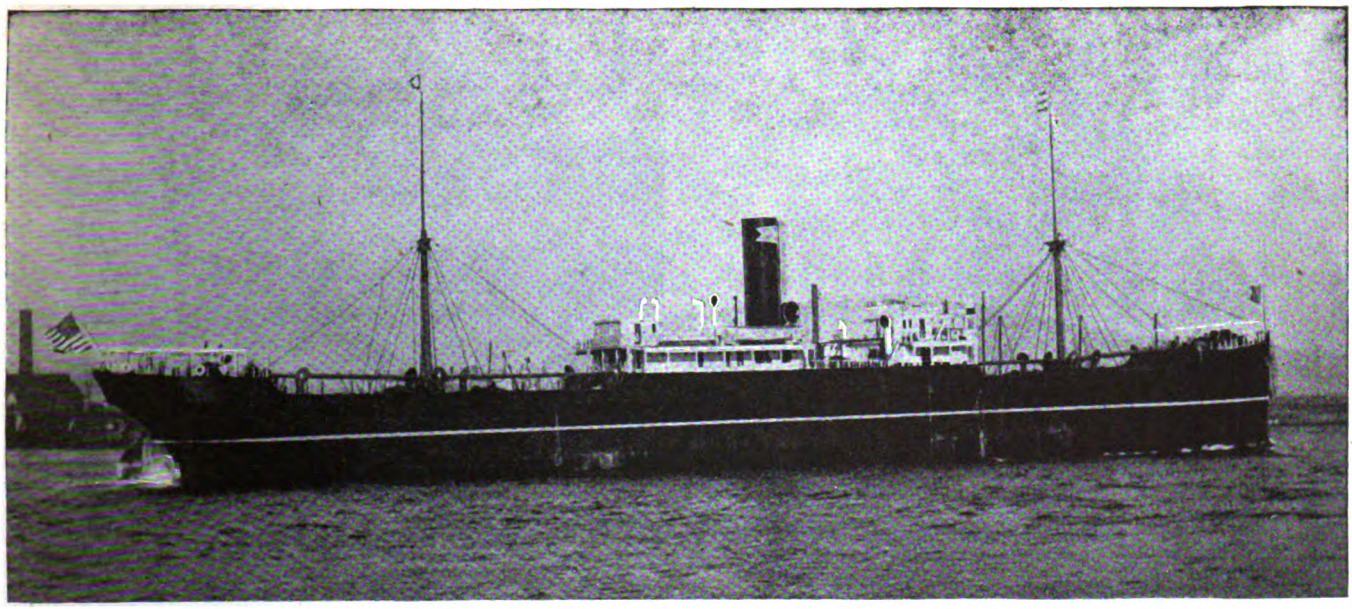

STEAMER CLARKSBURG DROPPING DOWN THE RIVER ON HER TRIAL TRIP

tons of feed water. With 23 feet 3 inches freeboard light, she is calculated to have a freeboard of 6 feet 8 inches when loaded to her maximum deadweight full carrying capacity. The vessel has an electric lighting plant, a steam heating system, a steam steering gear, a steam windlass and steam warping winch aft. The ship with the engine, boilers and equipment has been built to the special survey and highest classification of the American Bureau of Shipping and Lloyd's. She also meets the regulations of the United States steamboat inspection service.

Future of American Shipbuilding

BY J. W. POWELL

AMERICAN shipping and American shipbuilding must be closely allied if the United States in the future is to continue to be a shipowning nation. A large American shipowning industry is necessary to support a larger shipbuilding industry, and if this country's flag once more passes from the high sea, the nation's shipbuilding industry can be expected to again sink back into the position of relative insignificance that it occupied prior to 1916.

The world's total shipping tonnage is today somewhat greater than at the beginning of the war in July, 1914, and shipyards all over the world are monthly contributing a large increase to the prewar tonnage. Shipbuilding in this country can be expected to proceed at practically its present rate for the balance of the current year, after which its volume of tonnage output will rapidly decrease, unless new orders are received.

Until recently, the number of new contracts closed by American shipbuilders since the armistice has been practically negligible when compared with the total capacities of the yards. Recent contracts are nearly all for special oil tonnage which is not to be compared with ordinary shipbuilding as these boats are a tool of the oil business.

In England and northern Europe, the shipyards are full to overflowing, but difficulties in securing necessary materials and in obtaining output with the labor available have seriously slowed down production so that no great addition to the present tonnage can be expected from that direction.

The ocean freight rates that will obtain in the next two or three years will be an important factor in determining the amount of American shipbuilding, and the method determined on by the Emergency Fleet corporation in disposing of the enormous fleet of government owned ships will also be largely instrumental in settling the future during this period of this industry. The United States chamber of commerce has held a referendum vote on the proposed method to be followed by the government in dispossessing itself of this fleet. In general, the method that has been recommended by this body is to be highly commended and is one which would probably result in the greater good to the industry in the long run.

Because of the enormously greater cost of a ship today as compared with 1914, shipowners will continue to be slow to purchase tonnage until pressure for it has reached an acute stage.

There are signs, however, that this point is approaching, and it is believed that a considerable amount of tonnage is likely to be ordered in the near future, and, as early deliveries are essential, and cannot be obtained except in the United States, it seems reasonable to expect some proportion of the tonnage to find its way to American yards. It must be borne in mind, however, that this tonnage will be mostly of special type that cannot be handled by mushroom yards that sprang up to meet the urgent demands of war. It therefore seems probable that while a portion of the present industry may be able to maintain reasonable activity in the immediate future, another large part cannot expect to continue under the present unusual conditions.

A serious situation has arisen on the Pacific coast, due to the fact that the large freight differential against the coast which already represents a considerable portion of margin between selling price and cost that would be expected today, has been augmented by a further proposed in-

(Concluded on page 148)

The author is vice president of the Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.

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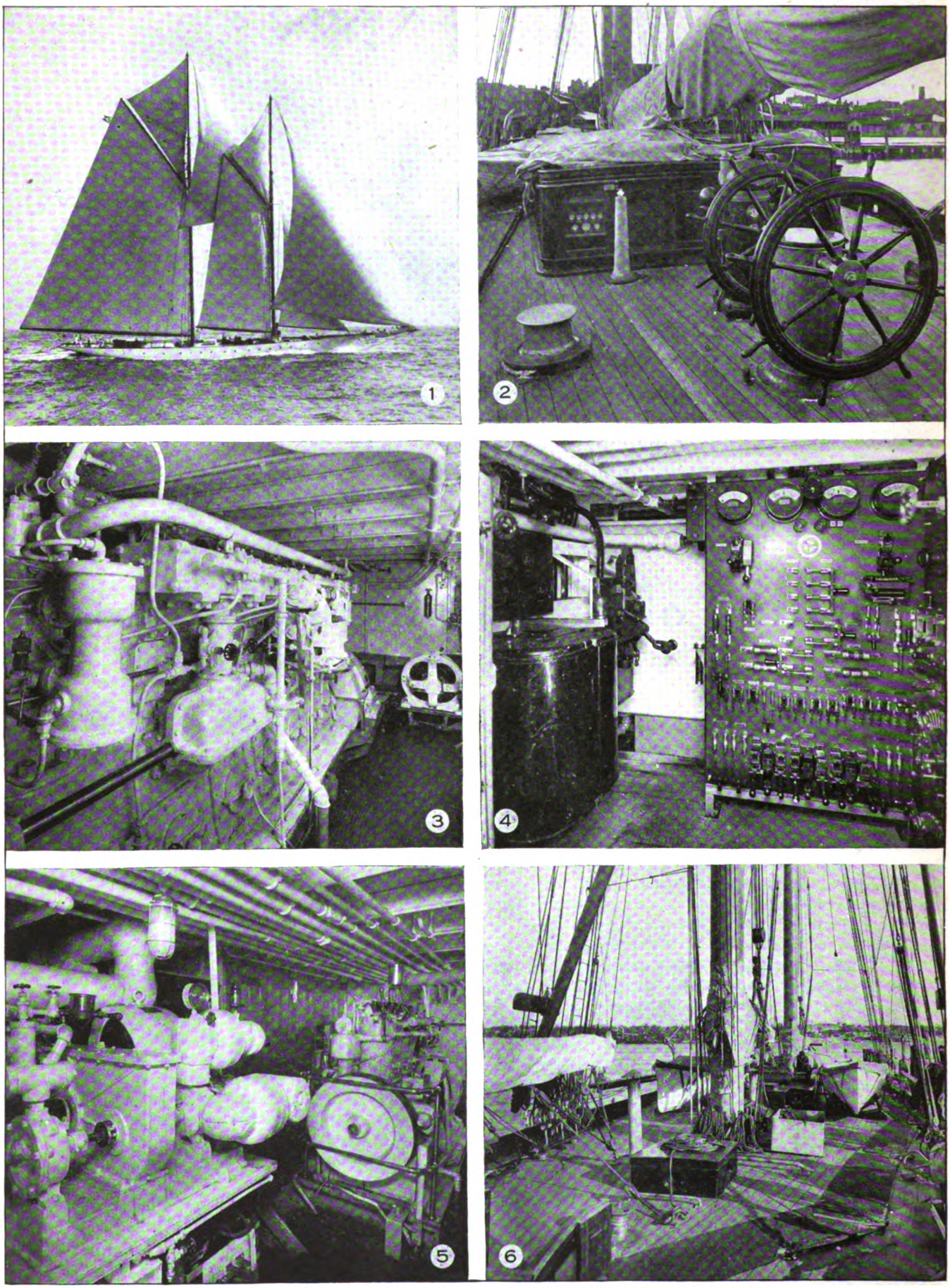

FIG. 1—ELFAY SAILING CLOSE HAULED FIG. 2—LOOKING FORWARD FROM AFTER DECK SHOWING CONTROL STATION FIG. 3—SIDE VIEW OF MAIN ENGINE FIG. 4—WESTINGHOUSE MAIN CONTROL STATION FIG. 5—ELECTRICALLY DRIVEN ICE MACHINE FIG. 6—LOOKING AFT FROM THE FORWARD DECK

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Yacht Has Gas-Electric Drive

Carries 2400 Gallons of Fuel Which Gives a Cruising Radius of 2000 Miles—Power Is Controlled from Deck

BY WILLIAM H. EASTON

MANY engineers believe that the oil-electric drive—in which some form of oil engine drives an electric generator, which in turn furnishes power to motors driving the propellers—will eventually prove the most satisfactory and efficient method of propelling ships having engines of ratings up to about 6000 horsepower. Among the chief advantages claimed for this drive are the following:

The engine operates continuously at constant speed in one direction only and therefore under ideal conditions.
Its fuel economy is high.
The electric system of distributing and applying power is flexible.
A simple and effective form of control can be used.
Great safety can be secured through the use of several main engines and generators, as well as two or more main motors and propellers, so that part of the equipment can be out of commission without crippling the ship.

A practical application of this drive has been awaited with considerable interest, and in consequence the yacht ELFAY, which went into commission in January, 1920, will probably occupy an important niche in the history of marine engineering as a pioneer in this development.

The ELFAY, formerly the KATOURA, was built by N. G. Herreshoff in 1914 for Robert E. Tod. She is a schooner, 152 feet beam overall, 115-foot waterline, 30-foot beam, and 313 gross tons. Though originally designed as a sailing vessel only, a gasoline auxiliary engine was later installed. She was bought by Russell A. Alger in 1916 and was used but little during the war. In 1919, Mr. Alger decided to put her into commission again and being desirous of equipping her with a more powerful auxiliary, selected the oil-electric driver.

The ELFAY'S main engine is a 6-cylinder Winton, full-diesel oil engine, with a 7½-inch bore, 11-inch stroke, rated at 115 horsepower and running at 425 revolutions per minute. It is equipped with a sensitive governor which controls the fuel supply and holds the speed of the engine practically constant, the maximum variation being about 20 revolutions per minute.

A 75-kilowatt, Westinghouse direct-current generator of 125 volts is directly connected to this engine. Driven from it by a silent chain is a 9-kilowatt, 125-volt exciter of 900 revolutions per minute, which supplies the field current for both the main generator and the propeller motor and also has about 5 kilowatt additional capacity for other purposes.

The 42 x 42-inch, 3-blade propeller is driven by a 90-horsepower Westinghouse motor of 350 revolutions per minute, which is placed as far aft as possible so that the shaft is short. A clutch is provided to disconnect the motor when the vessel is under sail. At the maximum motor speed, the boat logs about 8½ knots.

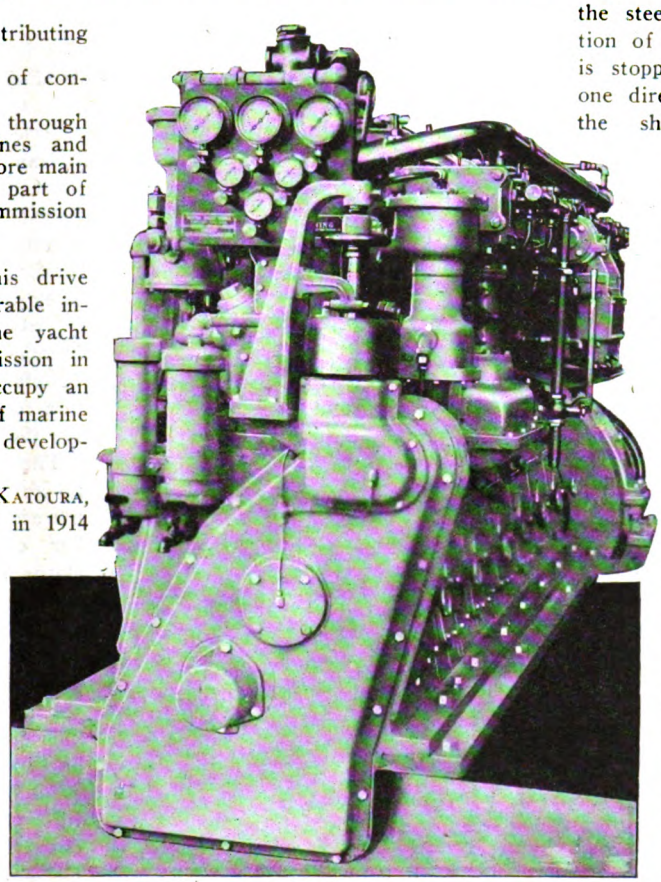

FIG. 7—END VIEW OF ELFAY'S 7½ x 11 OIL ENGINE

All of these electrical machines—the generator, exciter, and motor—are of standard design, the only special element being the use of ball bearings to permit operation with the vessel listing at a wide angle.

The method of controlling the ship is undoubtedly one of the most interesting features of the installation. When it is desired to use the power, the engineer starts the engine with its generator and exciter and brings them up to speed. He then closes the swicthes that connect the propeller-motor armature with the generator, and the propeller-motor field with the exciter. After this he has no further responsibility in the handling of the ship, except to keep the machinery running properly.

The entire control of the propeller is centered in a handle that is mounted on a pedestal on the deck just forward of the steering gear. In the center position of this handle the propeller motor is stopped. By turning the handle in one direction, the motor starts, driving the ship ahead with continuously increasing speed as the handle is turned, until full speed is reached. By turning the handle in the other direction the ship is driven astern in a similar manner. The change from full speed ahead to full speed astern can be made in five seconds. A set of meters is mounted in front of the control handle, which shows the voltages of the generator and the exciter, the current being taken by the motor, and the speeds of the generator and the motor. The navigator, therefore, has complete control of the vessel and can maneuver with the utmost speed and precision, since the motor responds instantly to the controller and there is no delay in transmitting signals to the engine room. At the same time the meters give him full information as to the operation of the machinery. The system used is that of the voltage control of the generator. The fields of both the motor and the generator are separately excited, as has already been stated. The motor field is kept always at full strength when the motor is in service, but the strength of the generator field is varied by means of a rheostat which is operated by the control handle. In the off position of this handle, the generator field is open so that no current is delivered to the motor. As the handle is moved around, the generator field strength is increased and the voltage of the current supplied to the motor

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and consequently the motor speed is also increased. When the control handle is reversed, the direction of the generator field current, and also the current to the motor, is reversed, but otherwise the action is the same.

The ELFAY is lighted and heated by electricity and all of her machinery is electrically operated, including a forward winch for the anchor, two winches amidships for the sails, a 1-ton ice machine, an air compressor, pumps for all purposes, ventilating fans, and electric fans in every room. A ½ kilowatt wireless outfit is also installed.

All such apparatus is supplied with power from the exciter when the main engine is operating and from a storage battery when the main engine is shut down. This battery consists of a 300-ampere-hour Philadelphia battery, which is charged by means of an auxiliary generating set consisting of a 25-horsepower Quayle engine, with an electric starter, which drives a 15-kilowatt generator. The battery has capacity enough to supply the needs of the boat (with the one exception of propulsion) for two days' operation without recharging.

While still too early to judge of the ELFAY'S performance, her propelling equipment has been thoroughly tested and has proved entirely satisfactory. It is claimed she can make 8½ knots on 7½ gallons of fuel oil per hour, and since she can carry 2400 gallons of fuel, she is able to run 2000 miles on her propelling equipment alone, although she will mainly depend upon her sails.

She is, of course, by no means a typical merchant vessel, but if the new drive proves successful on her it will unquestionably also be successful on purely commercial ships.

Shipping Board Forgets Inspection Law

A letter from Henry Penton, late district manager, Emergency Fleet corporation, Great Lakes district, and now in the Orient, calls attention to a situation which is anomalous to say the least and is pugnant with embarrassment, if not serious difficulty, for the shipping board, the officers of its vessels and the charterers and agents who are sailing them.

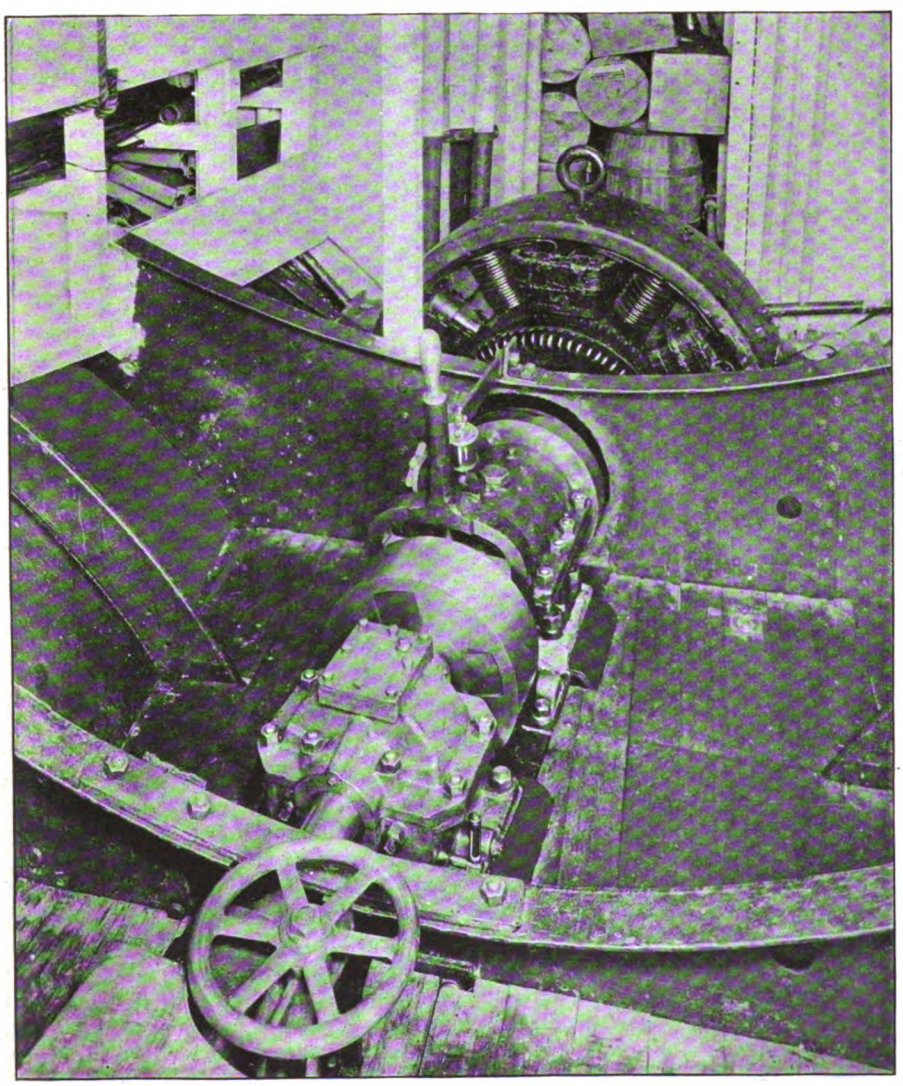

FIG. 8—NINETY HORSEPOWER WESTINGHOUSE MOTOR—THIS UNIT DRIVES THE PROPELLER

A considerable number of the board's ships have been assigned to Far Eastern trade, some of them operated by the Pacific Mail Steamship Co. For the purpose of collecting cargoes for assembly, at principal ports to which the larger ships will trade, there have also been assigned a number of smaller vessels, chiefly from the fleet built on the Great Lakes. Some of these latter vessels are already in the Orient and others are now enroute or will have arrived by the time this appears. All were built during 1919 and some of them early in the year.

Title LII. Chap. 1, Revised Statutes, Section 4418 provides for inspection of all steam vessels by the steamboat inspection service "at least once each year."

Section 4421 says: "No vessel * * * shall be navigated without having on board an unexpired regular certificate of inspection." A proviso is added covering cases where expiry occurs before completion of voyage but the limit is fixed at 30 days.

Now these feeder ships are intended to trade or call at various ports on the Japanese, Chinese and Indo-Chinese coasts, the Philippines, Java, Sumatra, Singapore, Penang, Colombo and even to Hindustan and in all probability, if the service is maintained, they will remain away from an American port indefinitely, except possibly that they may use Manila as a terminal. Some of these vessels will be due for reinspection within a few months, but no machinery exists for the purpose.

The steamboat inspection service has no service west of Hawaii. The ship, therefore, has no valid documents after her certificate expires and her legal status is as yet undefined. How, then, can she, as a United States vessel, continue to navigate in violation of the statutes? Her insurance, if carried by other than the board, is invalid because the warranty expires with the certificate. The same thing is true of cargo insurance and brings on a whole train of liabilities as to personal injury, loss of life, etc. It is doubtful if the ship could enter or clear legally. If boarded by an officer of the naval or revenue service, he would have no option but to stop her.

Nor is this all. Here is where the seamens' law, so-called, will if enforced surely put a quick end to the use of these ships. Title LII. Chap. 2, Section 4463, says no such vessel "shall be navigated unless she shall have in her service and on board such complement of licensed officers and crew, including certificated life boat men, separately stated, as may in the judgment of the local inspectors be necessary for her safe navigation." Such a crew list is, of

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course, part of her original certificate—and must stand until modified. That the same influence that put that provision in the act will or would ever consent to any modification, may be safely doubted. But, in case of such a shortage, how is it to be made good, with no inspection service nearer than Hawaii? The same act stipulates for the right of a seaman to leave his vessel whenever it pleases him.

And, to supply the comedy, the same section requires the master to report such shortage *within 12 hours, in writing,* to the local inspectors, of whom the nearest are 2000 miles, at least, distant. If he fails it costs him $50. If a vessel is short handed as to seamen or, what is the same thing, not manned according to the act, for whatever cause, the owner is liable to a penalty of $100, or in the case of licensed officers, $500. Will the shipping board be able, as an arm of the government, to evade these provisions?

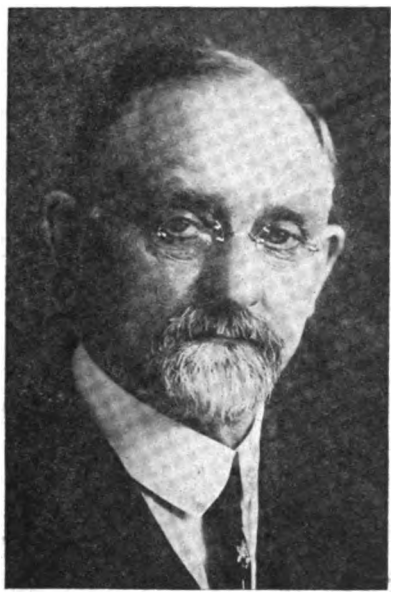
But if the ship happens to be chartered by the board to a private individual or company, Title XLVIII, Chap. 6, Section 4286 says: "The charterer of any vessel, in case he shall man, victual, and navigate such vessel at his own expense, or by his own procurement, shall be deemed the owner of such vessel * * * and such vessel when so chartered shall be liable in the same manner as if navigated by the owner thereof."

The real owner is the United States, which also made, and presumably will enforce, the law. The owner itself made the laws and created the very conditions under which liability will accrue. The whole situation is preposterous and is certain to breed trouble, but since it may have the effect of leading to a revision of the existing seamen's law, the sooner it comes the better. Of course our whole steamboat inspection law is a crazy quilt patchwork which never contemplated other than coastwise or regular liner service and it will never be otherwise so long as amendatory legislation has to be obtained as at present. Tramp service in remote waters is impossible under existing statutes. Doubtless amendment will be sought, with further complications and difficult conditions but the whole existing mass ought to be wiped off the books and a fresh start made, beginning with the constitution of a capable board of strong, competent men and leaving the whole thing in their hands. Such men will not be obtained, however, for the pittances now paid.

A large part of the force at the Algiers naval station, just across the Mississippi river from New Orleans, was laid off Feb. 1, due to failure of the house of representatives to pass the naval deficiency bill.

C. B. Calder 1853-1920

Charles B. Calder, general manager of the Toledo Shipbuilding Co., Toledo, O., who had followed the shipping business from boyhood and worked to the top from a minor position aboard ship, died Jan. 22, 1920. He was born Jan. 15, 1853, in Antwerp, N. Y. A few years after Mr. Calder's birth, his father purchased a farm of 1140 acres on Welles island. Mr. Calder was brought up on the farm and went to school until he was 13 years old. In 1866, when his father went into partnership with J. H. Crabb in a shingle mill venture, Mr. Calder went into the mill and ran the engine until November, 1872. At this time he shifted as a cook on a little schooner sailed by



CHARLES B. CALDER

Edwin Cook. Later he went to Oswego, N. Y., and took out a license as second assistant engineer.

In the spring of 1873 he helped put the engine in the UTICA, built by Robert Davis and Z. Wright. On July 1, 1873, he left the UTICA as his papers would not permit of him running her. He then shipped on the tug SARAH DALY and was on her until Nov. 1, 1873, when he went back to the UTICA, which was then running as a railroad ferry at Ogdensburg, N. Y. He sailed on her until the fall of 1874, when she was sold.

In the spring of 1875, he shipped on the INTER OCEAN as second assistant engineer, sailing on her until 1879 when he shipped as chief engineer of the tug NIAGARA. In that season he went back as second engineer of the INTER OCEAN. In 1880 he was made chief engineer of this vessel. In 1881 he shipped as chief engineer of the ESCANABA, sailing on her until the winter of 1886 when he superintended the compounding of the INTER OCEAN and the ARGONAUT. He then went to Cleveland to superintend the building of the IRA H. OWEN. He had a small interest in this vessel, and was her chief engineer until 1889, when he superintended the building of the PARKS FOSTER. He was chief engineer of her until 1891 when he accepted the position of port engineer of the Menominee Transportation Co.'s steamers. In 1892 he was appointed port engineer of the Mutual Transit Co.'s steamers in conjunction with the above.

On March 1, 1894, he accepted the position of superintendent of the Dry Dock Engine Works, Detroit, holding this position until 1899 when he was appointed general superintendent of the Detroit Shipbuilding Co. He held this position until the fall of 1905 when he resigned. He was one of the incorporators of the Toledo Shipbuilding Co., and was made general manager of that firm. In 1909 he was elected vice president and general manager which position he held until his death.

To Improve Harbors

The annual report of the chief of engineers of the United States rivers and harbors commission contains an account of improvements made and to be made in the harbors of Connecticut. Improvements at New Haven during 1919 have given that harbor exceptionally low water freight rates, particularly on bulk commodities. The harbor is such that considerable maintenance expenses for dredging is required. It is estimated that 110,000 cubic yards of dredging will be required in 1920. Coal forms the principal article of commerce of the New Haven harbor. Other items are oysters, petroleum, chemicals and sand, in addition to much general merchandise. Nearly all vessels engaged in commerce from New Haven are of light draft. During the year considerable work has been done at the Duck Island harbor which is midway between New Haven and New London and about 23 miles from each. Previously, this harbor offered no shelter from the east but riprap breakwaters have been constructed with the result that shelter is now afforded for all passing commerce of Long Island sound. Interest has been renewed in a project to make the Connecticut river navigable from Hartford, Conn., to Holyoke, Mass., and a proposed plan which would cost $1,870,000 is offered in the report.

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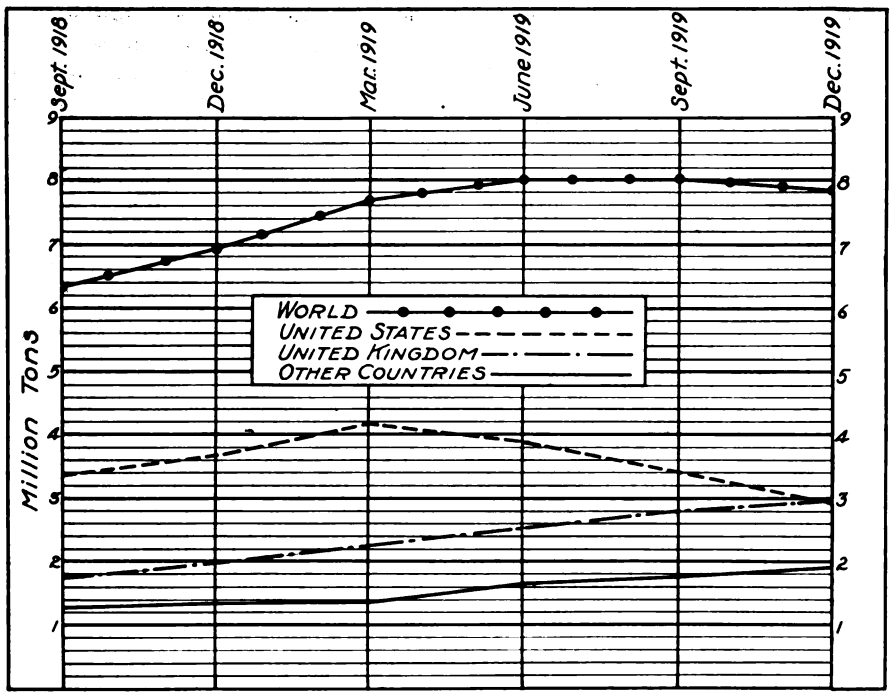

SHIP CONSTRUCTION THROUGHOUT THE WORLD FOR PAST 15 MONTHS

American Shipbuilding

(*Concluded from page* 143)

crease of wages which, if accepted by the shipyards, is a sufficient handicap to put the Pacific coast definitely and finally out of the shipbuilding business, thereby spelling the early end of this large portion of the American shipbuilding industry.

So many different conditions control the future of American shipbuilding beyond the next two or three years, that it is difficult to hazard even an educated guess as to what may be expected. The latest wage schedules paid in England still show the same percentage of difference between British and American shipyard wages as existed in 1914, when British shipyard labor was paid 50 per cent of American ship labor. Even as late as May, 1919, British shipyard rates were exactly that same percentage of American shipyard rates. On the other hand, the loss of efficiency in British yards is undoubtedly greater than in this country, while the disparity of wages between continental yards and United States yards is much less than before the war and materials for shipbuilding are somewhat cheaper in America today than in any other country.

The government can help the shipbuilding and shipowning industries to meet this difficulty by proper legislation, which should be achieved before the adjournment of the present congress.

An inadequate marine mortgage law, covering American ships, has been another handicap which has made the financing of ships difficult. The bill now before congress to correct this situation and which makes a ship mortgage a first lien will probably be passed at this session, and will further strengthen the future position of the American shipbuilder.

It will then be the problem of the congress of the United States to determine a national policy as to ships; that is, to determine to what extent its own shipping and shipbuilding are essential to the nation. Once this policy is settled on and adopted, the means to permanently achieve it are not difficult to find.

American-built and American-operated ships must be given an opportunity to earn a fair return on the capital invested, under operating conditions defined by American law, in competition with ships under other flags, built in foreign lands and operated under foreign laws.

Any means that will accomplish this end will result in the permanent establishment of as much of an American shipping and shipbuilding industry as the policy of the government may define as necessary to meet the needs of the nation.

The Material Handling Machinery Manufacturers' association will hold a convention at the Waldorf Astoria hotel, New York, Feb. 26 and 27. One of the primary purposes of this convention is to draw attention to the fact that the problem of handling materials is rapidly taking shape along scientific lines.

World Ship Construction

Merchant ships being built throughout the world aggregated 7,861,363 gross tons on Dec. 31, 1919, according to *Lloyd's Register of Shipping*. This represents a decrease from Sept. 30, 1919, of 187,219 tons. The figures are 8,048,582 tons for Sept. 30 and 7,861,363 tons for Dec. 31. Compared with the figures for Dec. 31, 1918, when the total was 6,921,989 tons, an increase of 939,374 tons is shown.

In the past year, British yards showed a gain of 1,014,297 tons while all other countries taken in the aggregate showed a loss of 74,923 tons. United States lost 679,404 tons and now ranks second to the United Kingdom. France, Holland and Italy registered big gains during the year.

England is building larger ships according to the returns. At the close of 1918, she was building 416 ships while 734 were in process of construction at the end of 1919. A year ago, English yards were building six ships from 12,000 to 15,000 tons and two ships from 15,000 to 20,000 tons. At the present time they are building 24 ships from 12,000 to 15,000 tons and 18 ships from 15,000 to 20,000 tons.

The accompanying chart graphically shows how England has caught up with the United States and how other countries have shown increases in the past 15 months. The following table shows ship construction under way at the close of 1919 and 1918:

	Dec. 31, 1919 No.	Dec. 31, 1919 Gross tonnage	Dec. 31, 1918 No.	Dec. 31, 1918 Gross tonnage
United States:				
Atlantic Coast	295	1,567,675	408	1,729,706
Gulf Ports	110	402,879	129	364,380
Pacific Coast	184	848,301	341	1,261,440
Great Lakes	58	147,660	119	290,393
Total U. S.	647	2,966,515	997	3,645,919
United Kingdom	757	2,994,249	424	1,979,952
British Dominions:				
Canada—Gt. Lakes	13	33,040	32	65,390
Canada—Coast	66	155,335	116	159,874
Other Dominions	34	63,105	47	53,447
Total Dominions	113	251,480	195	278,711
Belgium	8	26,293	..	.....
China	10	35,700	7	9,818
Denmark	56	100,335	51	72,143
France	65	216,775	12	51,690
*Germany	..	.....	..	.....
Greece	2	1,500	..	.....
Holland	126	328,338	113	212,512
Italy (inc. Trieste)	125	314,547	56	133,010
Japan	64	309,474	116	278,140
Norway	61	92,719	71	67,738
Portugal	9	5,210	36	15,120
Spain	28	107,463	35	77,597
Sweden	67	110,765	76	99,639
Grand total	2138	7,861,363	2189	6,921,989

*Figures not yet available.

The former German liner ZEPPELIN, 14,167 tons, which was allocated to the White Star line by the decision of the interallied maritime council at Paris, is now at the yards of Harland & Wolff, Belfast, Ireland, for a thorough overhauling and reconditioning.

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Launches Big Liner in Scotland

French Firm Plans Extensions—Builds Destroyer for British Navy —Cancel Many Contracts—Swedish Yards Obtain Vessel Orders

MESSRS. WILLIAM BEARDMORE & CO., LTD., Dalmuir, Scotland, recently launched the Anchor line steamer CAMERONIA. She is the largest liner to be laid down and floated since the armistice was signed and is said to hold a record in rapid construction. The keel of the vessel was laid on March 7, 1919. The liner, which is intended to replace a vessel of the same name lost during the war, embodies many novel features, the most notable being that she is to be fitted with geared turbines and is intended to use oil fuel.

The dimensions of the vessel are as follows:

Length, over all, 578 feet, 6 inches; length between perpendiculars, 550 feet; breadth, molded, 70 feet; depth, molded, 42 feet, 9 inches; measurement, 16,500 gross tons.

The vessel was built under special survey and class 100 A-1, Lloyds. In accordance with general practice in recent years a cruiser stern has been adopted. One funnel and two pole masts are fitted. On her designed load draft of 29 feet it is estimated that the vessel will be able to carry about 11,0000 deadweight tons. Accommodation is provided for about 265 first class and 370 second class passengers in 2 and 4-berth cabins, and for about 1150 third class in 2, 4 and 6-berth cabins.

The machinery, which is supplied by the builders, consists of two sets of Brown-Curtis turbines, each set comprising one high pressure, one intermediate pressure and one low pressure turbine, and having astern turbines incorporated in each intermediate pressure and low pressure casing. The turbines drive the propeller shafts through helical gearing of the double reduction type.

Steam is supplied by three double-ended and three single-ended boilers, burning oil fuel. The launching displacement of the vessel was 7000 tons, and the time taken in the movement of the ship was 1 minute 58 seconds. The naming ceremony was performed by Lady Hermoine Cameron of Lochiel, who also named the first CAMERONIA, launched from Meadowside shipyard in 1911.

Due to business extensions, Messrs Leroux & Heuzey, successors to Prentout-Leblond & Co., shipowners and consignees, Rouen, France, have moved their offices to 27 B. rue de Buffon. This firm was established over 35 years ago and before the war was managing 40,000 tons of ships of which 75 per cent were lost during the war. Ten years ago the company fitted out two vessels with diesel engines and opened a regular coal service of 1200-tonners between the United Kingdom and Paris.

Cancel Contracts

Many Norwegian shipowners, during the last year of the war, placed tonnage contracts in Norway at high prices and have since endeavored to cancel many of these contracts. According to the New York *Journal of Commerce*, some 94 contracts, covering 240,000 tons, are involved, but these totals by no means include all the new construction owners would like to cancel. Up to the present, 16 contracts have been canceled, against a compensation of $1,000,000. The Randolph yard at Fevig, has canceled all its contracts for a payment of $52,500 for each, which gives the company, whose capital is $125,000, the nice profit of $312,500. The Jarisoe yard has torn up its contract in consideration of $62,500 for each. It had eight contracts with one Bergen firm, so the yard acquires $500,000 on this one account. The Aalesund Mekaniske Verksted has let its patrons off cheaply at $25,000 each, but a Christiania firm has had to pay the Sorlandet Mekaniske Verksted $275,000 for release from two contracts of 4500 tons each. The .Fredrikstad Mekaniske Verksted has refused $125,000 to cancel the order for a steamer of 10,000 tons deadweight. Norwegian built tonnage is officially stated to be costing $250 to $300 per ton deadweight.

Builds Fast Destroyer

Messrs. J. Samuel White & Co., Ltd., shipbuilders and engineers, East Cowes, Isle of Wight, completed and delivered their 120th steel war vessel and seventy-second steel torpedo craft recently. The vessel is the WIVERN, a modern, powerful and up-to-date destroyer. Of the improved "W" class, she was laid down on Aug. 19, 1918, and launched on April 15, 1919. She is a similar vessel to the WITHERINGTON, WINCHESTER, WINCHELSEA, VORSEGERN and VECTIS, also built by the firm and now serving in the royal navy. She is of 1450 tons displacement and her engines develop a full 28,000 shaft horsepower. Her full power trials off the south coast of the Isle of Wight were entirely satisfactory. She attained an average speed of between 34 and 35 knots. The WIVERN'S twin screws are driven by a double set of Brown-Curtis geared turbines made by the shipbuilder and Mitchell thrust blocks have been installed. Steam is generated in three White-Forster water-tube boilers, each developing over 9000 shaft horsepower. The ship is capable of carrying some 400 tons of oil fuel, which will enable her to run about 1000 miles at full speed. Like the other destroyers of her class the WIVERN'S armament consists of superimposed 4.7-inch guns fore and aft, with fire control and director gear; two antiaircraft, high-angle, quick-firing guns, on an elevated platform amidships; and two sets of triple torpedo tubes mounted on revolving platforms.

The name WIVERN has hitherto been borne by but one ship of the British navy—an armored turret coast defense ship of 2750 tons, 1000 horsepower and four guns. A certain amount of romance is connected with this vessel, due to the fact that she was built for the Confederate States of America in 1862-1863 by John Laird, Birkenhead. She never flew the stars and bars, however, as she was purchased by Great Britain from the builders and transferred to the royal navy. Eventually she was sent to Hong Kong where she ended her career a few years ago.

Sweden Gets Contracts

According to a Goteborg, Sweden, newspaper, the Stockholm firm of shipowners, Aktiebolaget Transatlantic, is pushing a building program which contemplates the construction of vessels totaling 120,000 tons. It is reported that this company has ordered eight new motor ships of 9400 gross tons each from the Gota works, and also a tanker of 7300 tons. Four steamers of 8000 tons each are reported to have been ordered by A/B Transatlantic from the Lindholmen shipyard, and two of 3500 tons each from the same yard.

The old tonnage which the company purchased during the war is being sold as rapidly as possible. When its building program is completed, it is said that A/B Transatlantic will have a modern fleet aggregating 275,000 tons.

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Oceanographic Museum

Determines Course Taken by Floating Mines

Prince of Monaco's Studies of Ocean Currents Aid in Charting Probable Drift of Menaces to Commerce

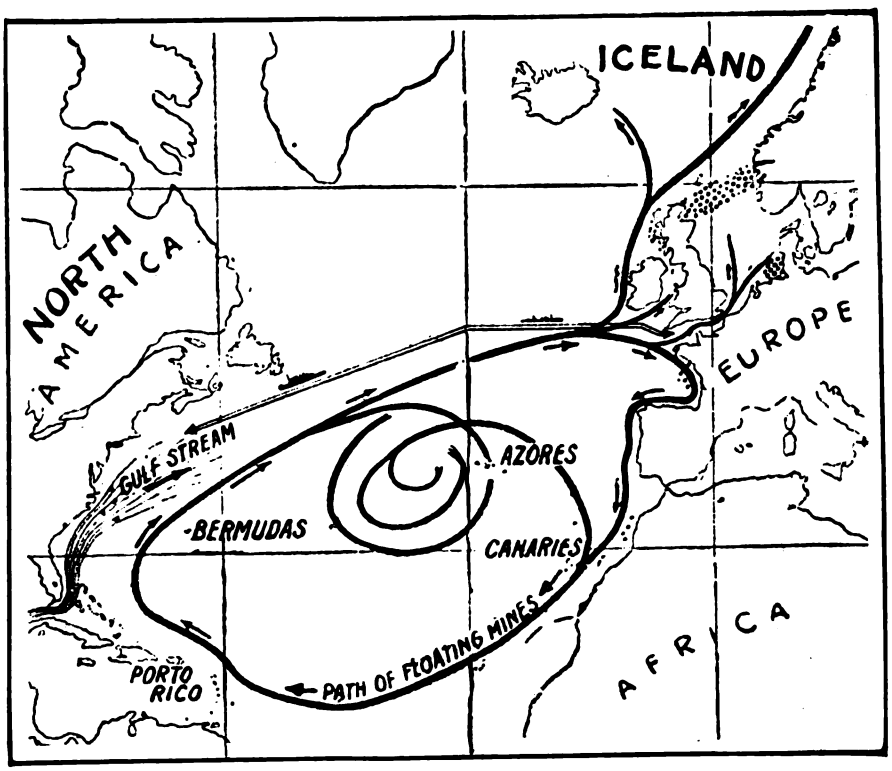
BY FRANCIS MILTOUN

Prince of Monaco

THESE lines are written on a site overlooking the Bay of Hercules, the Portus Herculis Monoeci of the Romans. I have just visited the splendid Oceanographic museum founded by Prince Albert of Monaco, wherein are displayed the results of his many years of deep sea studies made in all the seven seas from the decks of his three specially equipped hydrographic craft. Models of these craft are prominently shown—first the sailing schooner the PRINCESS ALICE, named for Miss Alice Heine of New Orleans, the wife of his early years of manhood, next the second of the name a steam yacht of imposing proportions and third the HIRONDELLE, which for a fact a dozen years ago I assisted in launching in the famous Rade de Toulon. A report issued in France has just given a list of ships which were supposedly lost as a result of contact with floating mines during June, 1919, six steamers and one sailing vessel being put down to the explosion of drifting mines with five others of which no news exist, their disappearance doubtless coming from the same cause. Not only were these losses accredited to home European waters but throughout the globe.

The Prince of Monaco has prepared a chart which indicates the probability of the North sea mines laid by Germany and the allies having broken adrift and found their way into the path of transatlantic steamers. By no means is this pure conjecture, but rather based upon a series of studies and experiments extending over many years in which an immense amount of research work was necessary.

He arrived at his deductions by the use of a remarkable series of indicating instruments destined to study and record the drift of ocean currents. He invented a peculiar sort of a floating buoy which he used with great success in his observations on the course of the Gulf stream. Each of these *flotteurs* contained a cylinder in which was enclosed a document printed in various languages intended to be returned with observations noted when and by whomever found. The moment that it was sent adift was noted on this document and the further details when filled in gave him a series of statistics far more reliable than the graphics which the gambling touts sell in his lovely principality which are supposed to show the chances which a "louis" has for making a fortune, or some part of it, for its enraged owner when



PRINCE OF MONACO'S CHART OF THE NORTH ATLANTIC SHOWING PROBABLE DRIFT OF FLOATING MINES, A CONSTANT MENACE TO NAVIGATION

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he throws it upon the green baize tables of the casino which sits opposite the princely palace on the other bank of the Bay of Hercules.

The sum total of these hydrographic charts of the current of the Gulf stream, which have been compiled by this monarch of the tiniest state of Europe, is set forth in the accompanying diagram. Apparently the northern steamer lines are free from a possible encounter. Steamers crossing by the Azores are not so assured, being obliged to traverse at least seven of these revolving currents. Southward from the United States to South America the crossing of the currents are accomplished twice. A Norwegian steamer lost on May 24 and an American steamer on Dec. 26, 1918, may well have come into contact with one of these drifting mines of which may tens of thousands were planted around Great Britain and the entrance to the Mediterranean during the latter months of the war.

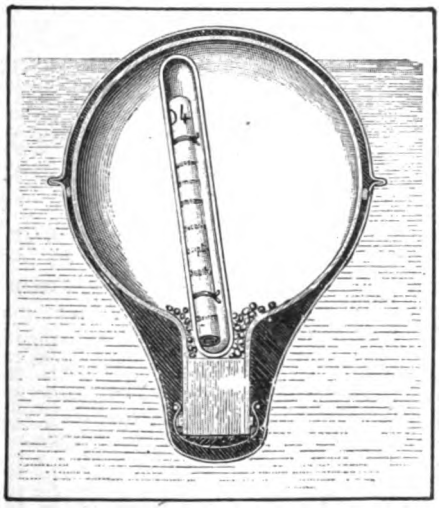
Currents Cover Large Area

Curiously the currents fork back again and off to the north and west of England and the Scottish coast, following also the shore line of Norway to the Arctic circle. The MARS, a Danish steamer, was lost on Dec. 4, 1918, en route from Copenhagen to the Lofoten islands.

Summing up, the danger to Atlantic shipping by the northern route appears to be small, and greatest only as the ships are nearing the English, Irish, Spanish and African coasts.

At all events the work of the Prince of Monaco is not overly well known when compared with the other activities of his little principality, scarce four miles long and a mile wide. For a fact, the prince has little enough to do with the gilded gambling halls which have so largely made the fame of the port of Hercules since the Romans relaxed their vigilance and moved the base of their Roman legions marching upon transalpine Gaul to the Gulf of Lions a hundred miles to the west. For this reason it is proper that the scientific work of Prince Albert of Monaco, the direct descendant of the seignieurs of Grimaldi, should be given its proper focus.

ONE OF THE MOST FAMOUS SPOTS IN THE WORLD—MONTE CARLO



HOLLOW FLOAT FOR DETERMINING DRIFT OF OCEAN CURRENTS

HARBOR OF MONACO WITH PALATIAL PLEASURE CRAFT AT ANCHOR

A. S. Mather 1886-1920

Amasa Stone Mather, who was admitted to partnership in Pickands, Mather & Co., Cleveland, Jan. 1, 1919, and placed in charge of the iron ore department, died, Feb. 9, at his home in that city from pneumonia after an illness of a week. Mr. Mather was 34 years old and was associated with his father, Samuel L. Mather, in many business enterprises. He acted as secretary of the subcommittee on pig iron, iron ore, and lake transportation of the American Iron and Steel institute, which looked after pig iron, and other supplies during the period of governmental regulation. When the armistice was signed, he was attending the officers' training school at Camp Zachary Taylor. Mr. Mather was born in Cleveland in 1886; he attended the public schools for a short time but later went to University school, entering Yale university in 1904, from which he was graduated in 1908. A hunting trip around the world followed and since that time he has enjoyed a number of annual hunting trips, the last one taking him to northern Canada in the spring of 1919. His knowledge of hunting was so extensive that the late Theodore Roosevelt, prior to leaving on his famous big game hunt in South Africa, consulted Mr. Mather concerning his experiences there in 1908. He was a member of the American Iron and Steel institute and the Cleveland chamber of commerce.

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Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

Name of vessel	Date	Nature	Place	Damage resulting
Aureole	Jan. 21	Grounded	Off Norway	Serious
Ardgowan	Jan. 15	Engine Trouble	At sea	Not stated
Arethusa	Jan. 27	Grounded	Toddy rocks	None
Allies	Jan. 28	Collision	At sea	Lost propeller blade
A. G. Fisnor	Jan. 28	Sprung leak	At sea	Slight
American	Jan. 30	Leaking	At sea	Slight
Artemis	Jan. 25	Fire	At sea	Damaged bunkers
Alliance	Jan. 20	Mch. trouble	At sea	Lost propeller blade
Argentina	Jan. 17	Mch. trouble	At sea	Damaged rudder
Atalaia Braz	Jan. 18	Grounded	Pea Patch shoal	Dented plates
Arlington	Jan. 22	Grounded	Boston harbor	Slight
Asuncion	Jan. 16	Grounded	Off Port Cavallo	Not stated
Afrique	Jan. 16	Sunk	Bay of Biscay	Total loss
A. M. Pioneer	Jan. 15	Grounded	New York	Not stated
Agawam	Jan. 15	Mch. trouble	At sea	Damaged propeller
Annie and Reuben	Jan. 15	Heavy weather	At sea	Lost sails
Anton Van Driel	Jan. 18	Grounded	St. Mary's bay	Total loss
Ashburn	Jan. 15	Boiler trouble	At sea	Tubes damaged
Buffalo Bridge	Jan. 21	Disabled	At sea	Broke propeller
British Isles	Jan. 22	Engine trouble	At sea	Slight
Broncho	Jan. 29	Mch. trouble	At sea	Burst feed pump
Belota	Jan. 30	Grounded	Off Florida	Total loss
Benoni	Jan. 28	Fire	At sea	Slight
Borgestad	Jan. 19	Caught in ice	Off Sandy Point	Slight
Boilston	Jan. 15	Sprung leak	At sea	Not stated
China	Jan. 21	Grounded	Off Japan	Slight
Canadian Gunner	Jan. 24	Grounded	Cape Henry	Not stated
Capines	Jan. 15	Engine trouble	At sea	Not stated
Charles Whittemore	Jan. 28	Cut by ice	Del. breakwater	Leaking
Campello	Jan. 30	Mch. trouble	At sea	Slight
Carolina	Jan. 19	Fire	At sea	Total loss
Catania	Jan. 16	Grounded	Mouth of Miss.	Total loss
Chamberino	Jan. 24	Grounded	Bordeaux	Not stated
Carnifax	Jan. 20	Mch. trouble	At sea	Pumps choked
Cassandra	Jan. 20	Collision	Halifax	Stove bow
Clarksburg	Jan. 15	Disabled	Off Cape Henry	Not stated
City of Colombo	Jan. 10	Heavy weather	At sea	Damaged fittings
Donald	Jan. 16	Hit pier	St. Johns	Damaged windlass
El Siglo	Jan. 24	Grounded	Near Cape Henry	Slight
Ernemore	Jan. 23	Heavy seas	At sea	Deck damage
Eastern Queen	Jan. 16	Fire	At sea	Not heavy
Elkhorn	Jan. 19	Engine trouble	At sea	Slight
Emily S. Baymore	Jan. 10	Heavy weather	At sea	Lost gear
Englewood	Jan. 28	Mch. trouble	At sea	Slight
Florence Luckenbach	Jan. 28	Disabled	At sea	Broke steering gear
Farabay	Jan. 16	Boiler trouble	At sea	Tubes salted
Frances Gardner	Jan. 15	Grounded	Off Cape Race	Total loss
F. Q. Barstow	Jan. 22	Grounded	Off Tobago	Holed forward
Guildford	Jan. 16	Distress	Off Halifax	Not stated
Giuseppe d'All	Jan. 30	Grounded	Near Cape Henry	Slight
G. H. Dalzell	Jan. 17	Fire	Weehawken	Serious
Gortynia	Jan. 22	Grounded	Off Bermuda	Not stated
Gudrun	Jan. 15	Fire	At sea	Damaged boiler room
Gilbert Islands	Jan. 5	Grounded	Fiji Islands	Serious
Glen White	Jan. 10	Collision	Off New Jersey	Damaged plates
Isis	Jan. 15	Grounded	Off Florida	Stove in
Ice King	Jan. 25	Leaking	At sea	Slight
Irene S. Wilkinson	Jan. 25	Damaged rudder	At sea	Slight
Independence	Jan. 20	Grounded	Cape Henry	None
Isaiah K. Stetson	Jan. 24	Grounded	City Island, N. Y.	Slight
John Adams	Jan. 15	Disabled	At sea	Broke steering gear
Jane Palmer	Jan. 27	Lost anchors	At sea	Slight
John M. Emery	Jan. 18	Grounded	Off Brazos river	Not stated
Kennebunk	Jan. 15	Sprung leak	At sea	Slight
Kennebec	Jan. 29	Grounded	Havana harbor	Not stated
Kickapoo	Jan. 17	Disabled	At sea	Lost propeller
Kaskaskia	Feb. 1	Fire	North River	Not heavy
Keyseeka	Jan. 30	Boiler trouble	At sea	Slight
Karlanna	Jan. 20	Grounded	Off Cape May	Lost rudder
Kaskia	Jan. 20	Fire	Hoboken	Heavy
Lakeville	Jan. 25	Grounded	Fire island	Not stated
Lake Frenchton	Jan. 17	Collision	At sea	Not heavy
Lake Festina	Jan. 15	Lost propeller blade	At sea	Slight
Langton Hall	Jan. 28	Engine trouble	At sea	Slight
Lenape	Jan. 26	Grounded	Off Florida	Slight
Langley	Jan. 25	Mch. trouble	At sea	Broke rudder chain
Lake Harney	Jan. 20	Grounded	Fire island	None
L. L. Hamlin	Jan. 19	Leaking	At sea	Not heavy
Lord Dufferin	Jan. 20	Mch. trouble	At sea	Slight
Lake Gazette	Jan. 17	Not stated	At sea	Damaged windlass
Levi W. Ostrander	Jan. 10	Sprung leak	At sea	Slight
Lake Fontanet	Jan. 10	Mch. trouble	At sea	Not stated

Name of vessel	Date	Nature	Place	Damage resulting
Macona	Jan. 17	Foundered	Off Norway	Not stated
Moraine	Jan. 28	Engine trouble	At sea	Slight
Mount Vernon	Jan. 30	Mch. trouble	At sea	Disabled pumps
Marne	Jan. 26	Fire	Panama	Sunk
Mayport	Jan. 27	Grounded	Roncador reef	Not stated
Macona	Jan. 19	Grounded	Off Sweden	Total loss
Monte Grappa	Jan. 30	Furnaces collapsed	At sea	Not stated
Maratanza	Jan. 15	Boiler trouble	At sea	Tubes leaking
Marie	Jan. 11	Sunk	Parrsboro, N. S.	Not stated
Manchester Port	Jan. 10	Collision	Off New Jersey	Damaged stem
Mielero	Jan. 26	Sunk	At sea	Total loss
Neponset	Jan. 29	Engine trouble	At sea	Slight
Nero	Jan. 31	Grounded	English channel	Not stated
Nevada	Jan. 31	Stuck in ice	Off Rockland, Me.	Slight
Northern Chief	Jan. 18	Grounded	Off Nukualofa	None
Oskaloosa	Jan. 24	Disabled	At sea	Broke steering gear
Oscoda	Jan. 31	Mch. trouble	At sea	Damaged propeller
Opelika	Jan. 10	Mch. trouble	At sea	Damaged condenser
Ocean Transport	Jan. 30	Heavy weather	At sea	Flooded holds
Providence	Jan. 25	Grounded	Sabine, Tex.	None
Prusa	Jan. 18	Grounded	Not stated	Slight
Pocahontas	Jan. 17	Collision	Thames river	None
Polar Sea	Jan. 28	Grounded	Off Rio	Not heavy
Powhatan	Jan. 15	Disabled	At sea	Not stated
Puna	Jan. 25	Heavy seas	At sea	Lost fittings
Poughkeepsie	Jan. 15	Disabled	At sea	Not stated
Patrician	Jan. 15	Collision	River Mercy	Not stated
Quoque	Jan. 15	Grounded	Off Florida	Slight
Rosina	Jan. 15	Sprung leak	At sea	Not stated
Sturgeon Bay	Jan. 15	Grounded	Off Florida	Slight
Sildra	Jan. 17	Lost anchor	Hampton roads	None
Sanford	Jan. 29	Grounded	Off Georgia	Heavy
Sarah E. Turner	Jan. 28	Engine trouble	At sea	Slight
Santeramo	Jan. 30	Heavy weather	At sea	Lost deck load
Sidney O. Neff	Jan. 28	Icebound	Off Chicago	Not stated
Santa Paula	Jan. 30	Struck rock	Off Philadelphia	Slight
Shannock	Jan. 23	Fire	Philadelphia	Heavy
Schroon	Jan. 19	Grounded	Near London	Slight
Seypen	Jan. 19	Mch. trouble	At sea	Not stated
Santa Cecelia	Jan. 18	Grounded	Off Italy	Holed in bow
Sun	Jan. 19	Grounded	Reedy Island	Not stated
Seal	Jan. 16	Grounded	Off Halifax	Slight
Sagona	Jan. 16	Grounded	Off Halifax	Slight
Sant Fost Span	Jan. 30	Grounded	Off Georgia	Not stated
Trimountain	Jan. 21	Grounded	Elbe river	None
Tamarac	Jan. 16	Disabled	At sea	Broke rudder
Tamaqua	Jan. 28	Collision	Off Delaware	Dented plates
The Lambs	Jan. 31	Grounded	Off Savannah	Not stated
Thistlemore	Jan. 31	Lost anchors	At sea	Slight
Turret Court	Jan. 19	Heavy seas	At sea	Flooded engine room
Treveal	Jan. 15	Stuck	Off Weymouth, Eng.	Total loss
Teresa	Jan. 25	Mch. trouble	At sea	Not stated
Vaarli	Jan. 17	Fire	Port of Valencia	Not stated
Vanlear Black	Jan. 15	Lost sails	At sea	Not stated
Venusia	Jan. 15	Mch. trouble	At sea	Lost blade
Waubesa	Jan. 17	Disabled	At sea	Slight
Wynooche	Jan. 16	Collision	Sandy Hook	Stove bow
Wauconda	Jan. 16	Engine trouble	At sea	Not stated
West Imboden	Jan. 27	Fire	At sea	Slight
West Hematite	Jan. 28	Disabled	At sea	Lost propeller blade
Western Hope	Jan. 28	Collision	At sea	Slight
West Galeta	Jan. 28	Mch. trouble	At sea	Slight
Wacammau	Jan. 30	Grounded	Boston harbor	Slight
War Ranee	Jan. 30	Heavy seas	At sea	Deck damage
Westerner	Jan. 30	Mch. trouble	At sea	Damaged steering gear
Wildomino	Jan. 29	Grounded	Off Farlund	Not stated
West Corum	Jan. 26	Disabled	At sea	Not stated
West Zula	Jan. 27	Mch. trouble	At sea	Stripped propeller
William F. Kelly	Jan. 30	Sunk	Galveston, Tex.	Not stated
Wakulla	Jan. 15	Leaking	At sea	Not stated
West Jaffrey	Jan. 19	Grounded	Boston harbor	Slight
W. T. White	Jan. 19	Sunk	At sea	Total loss
Wabash	Jan. 22	Heavy seas	At sea	Damaged bow
Western Queen	Jan. 15	Collision	River Mercy	Slight
Zaca	Jan. 17	Boiler trouble	At sea	Burst tubes

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Problems of the Vessel Operator

Urges U. S. Lines to Dock at Cherbourg — Makes Fast Pacific Trip—Admit Alien Mariners—Transfer of Insurance

CHERBOURG is a small village on the French coast of the British channel. Its name is well known to passengers crossing the Atlantic but, for the average shipowner, it looks more like a secluded spot on the globe where there is not much to be done. But such is not the case. It is true Cherbourg has but 50,000 inhabitants but an equal number of passengers cross it every year, to and from America. Cherbourg has practically no docks but it has a splendid sound, well protected, in which any number of leviathans can call at the same time without being crowded for space and without having to wait for a tide. There is a first class accommodation at the landing stage, special trains are provided which run to Paris in six hours. The position of this little port is so well acknowledged by the big passenger services that the Cunard line intends taking the best of what the Germans have left.

Cherbourg, as a commercial possibility, was discovered by the Germans for the north Atlantic trade, over 30 years ago, and they began to call there to land and ship passengers to and from the United States. The American line next came in, then another German line, the Booth line, the White line, etc. In the meantime, the Royal Mail Steam Packet Co., which was an old customer, took an increasing interest in the calls at this place and the German companies for the West Indies, of course, followed suit. With the Cunard steamers calling in the French sound, all the north Atlantic lines will have their services in the same harbor with the exception of the French line. Cherbourg will be the international call where the companies will have to come if they will gather bookings for New York or the continent. And one cannot help thinking now that it would be a great pity if the American whose fleet of liners is now one of the best did not manage to secure a good position in the international fair. They must hustle and make immediate arrangements.

(Signed) A. Aanièce & Fils,
Cherbourg, France.

Fast Pacific Trip

What is believed to have been a record speed voyage from New York to Auckland, New Zealand, has just been completed by the steamer ARMAGH, dispatched from New York by Norton, Lilly & Co., on Dec. 10 last. The ARMAGH is a 14,000-ton vessel, and carried a full cargo of miscellaneous freight. According to cable advices from Auckand, the ship arrived there on Jan. 6, taking only 27 days for the trip. The ARMAGH arrived at the Panama canal on Dec. 16, and sailed from there on Dec. 17.

Modifies Liquor Law

Assistant Secretary of the Treasury Jouett Shouse has signed a treasury decision which permits the daily distribution to the crews of foreign vessels, while in the ports of the United States, of the usual quantity of liquors allowed them with their meals.

"This decision is being issued to modify the treasury decision of Dec. 11, 1919, which made the selling liquors on ships in our ports applicable both to American and foreign vessels," said Mr. Shouse. "International comity requires that every courtesy be extended to foreign vessels while anchored in our waters. American vessels are still subject to the requirements that all liquor on board be kept under seal during the stay of the vessels in port.

"The decision of Dec. 11, 1919, was based on an opinion of the solicitor of the treasury. That regulation was made the subject of protests from several foreign governments, and for that reason the question was placed before the attorney general for review and final decision. The present regulation is based upon an opinion received from him."

Admits Alien Mariners

During the year ended June 30, 1919, a total of 4142 alien immigrant mariners were admitted to the United States while 441 departed, according to the report just made to congress by the commissioner general of immigration. During the same period 4816 alien non-immigrant mariners were admitted while 2540 departed. The net increase in mariners in this country was, therefore, 3701 immigrant mariners and 2276 non-immigrant mariners.

The commissioner of navigation reported that during the fiscal year a total of 255,922 seamen were shipped and reshipped, of which number 97,160 were native and 24,676 were naturalized Americans. Of the 255,922 seamen shipped or reshipped, 3502 failed to join the American vessel on which they had contracted to serve.

Virtually no penalty is imposed on the seaman who violates his written contract by deserting or failing to join in the United States an American vessel on which he has contracted to work, according to the commissioner's report. Since 1898 the punishment provided by law is the forfeiture of all or any part of the wages or effects he leaves on board and of all or any part of the wages or emoluments which he has then earned. The greater number of failures to join are after articles are signed but before the voyage has been begun, when usually no wages have been earned subject to forfeiture.

Transfer of Insurance

How often is a marine insurance policy issued to a reputable ship operator transferred to an operator who knows little about his business, thereby increasing the risk under the policy? This important question recently was raised by S. D. McComb, of the Marine House of America, New York, in an address before a gathering of insurance men.

"In writing hull policies," said Mr. McComb, "I believe consideration should be given to using the word 'charterers' with the intent of extending the policy to protect them. If the charterer is to obtain free insurance under owners' policies and have his liabilities assumed by the owners' underwriters it will have a tendency to increase hull claims and will certainly not make the charterers more careful in handling the vessel. Would it not be better to omit the word 'charterers?'"

The question of putting a limit to those who can collect under a policy is worth consideration. It has become general to issue policies for the account of whom it may concern. Under such conditions an underwriter might think he was insuring one man and actually be insuring another, and one whom he would not knowingly have insured at all. This point is becoming more important now as a number of persons new to the business are acquiring ships.

Government officials have reported a present depth of 24 feet at low water on the Grays harbor bar, this being sufficient depth to float large carriers at high tide.

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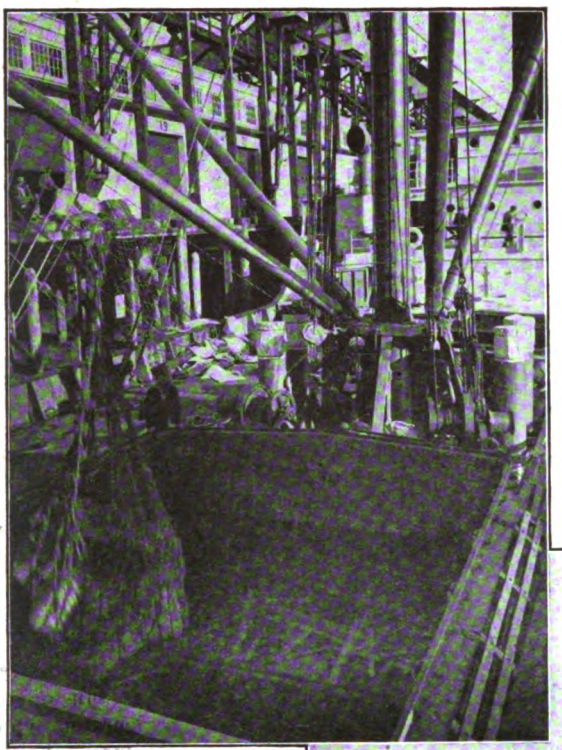
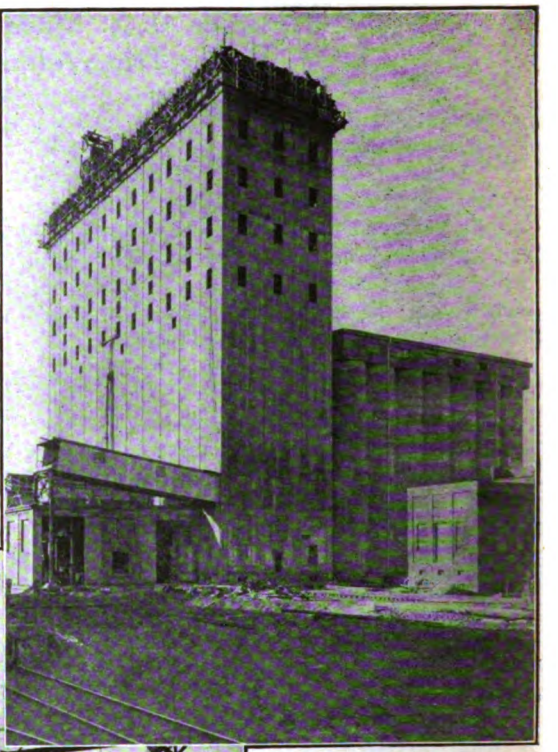
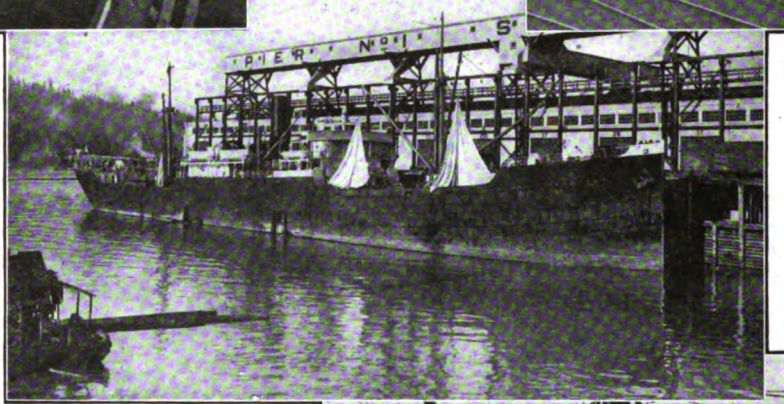
Photographs From Far and Near



Portland, Oreg., is making great improvements in its port facilities. St. John's terminal, to be one of the best equipped in the United States, is about one-third completed. About $4,500,000 has been expended; $6,000,000 more is to be spent, as well as several millions more in port improvements

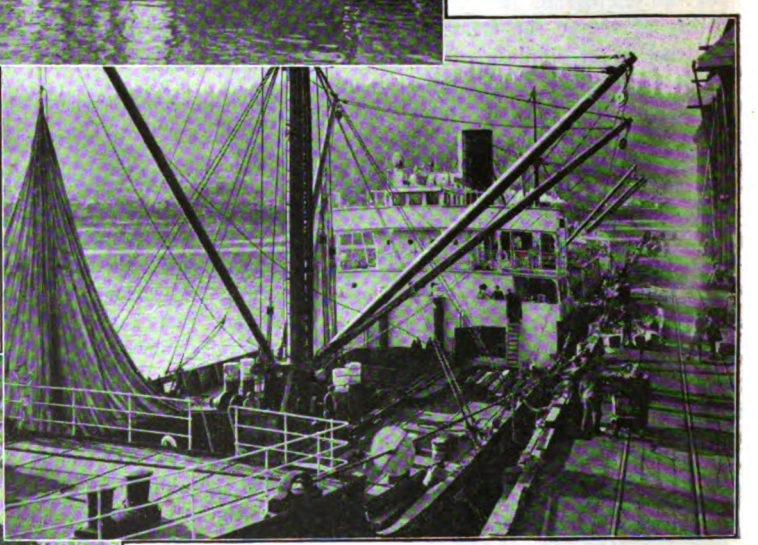


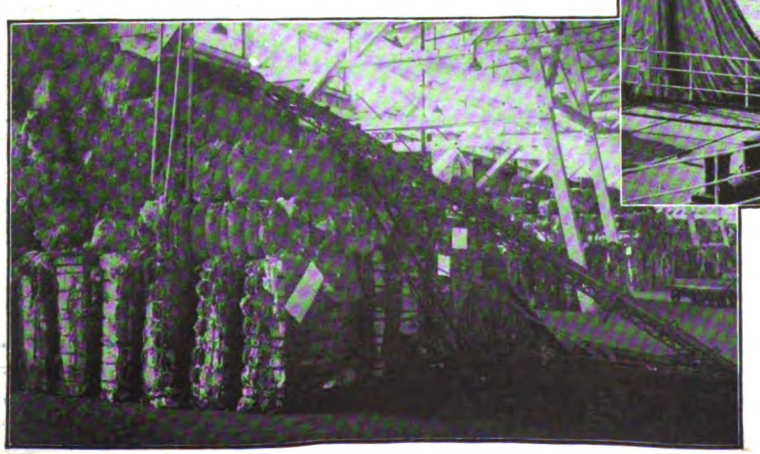
Unloading rubber at Portland's new municipal terminal. Five thousand tons unloaded, weighed, inspected and placed aboard cars enroute to the east in seven days



The grain elevators which are part of the terminal will have a capacity of 2,500,000 bushels. The capacity of the first unit shown in the illustration is 1,000,000 bushels

The steamer West Hartland, in the transpacific trade, discharging her cargo of rubber and hemp at Pier No. 1 of Portland's new terminal. The terminal is being built in units, the money being provided by municipal bond issues





Eighty thousand bales of cotton recently passed through the terminal, representing a single consignment for the Orient. The port is being equipped with modern loading and unloading devices

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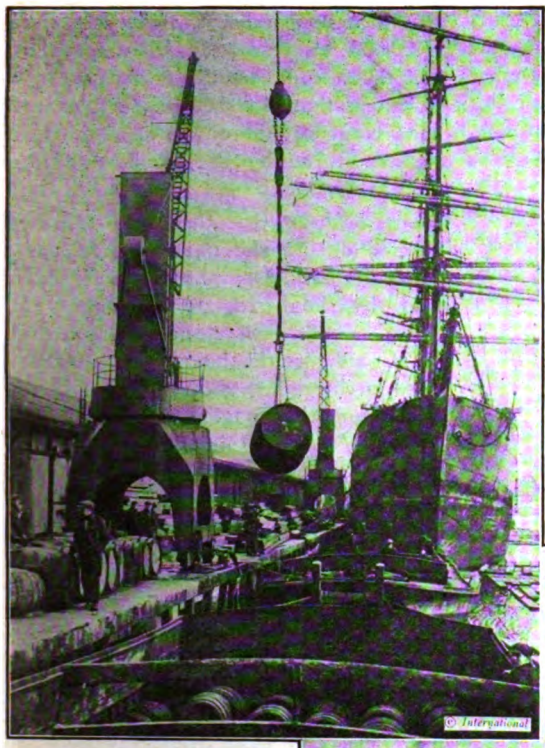
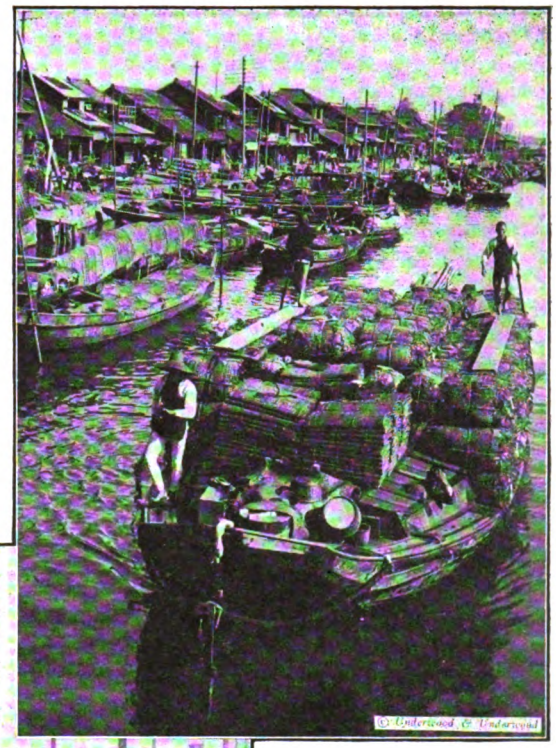
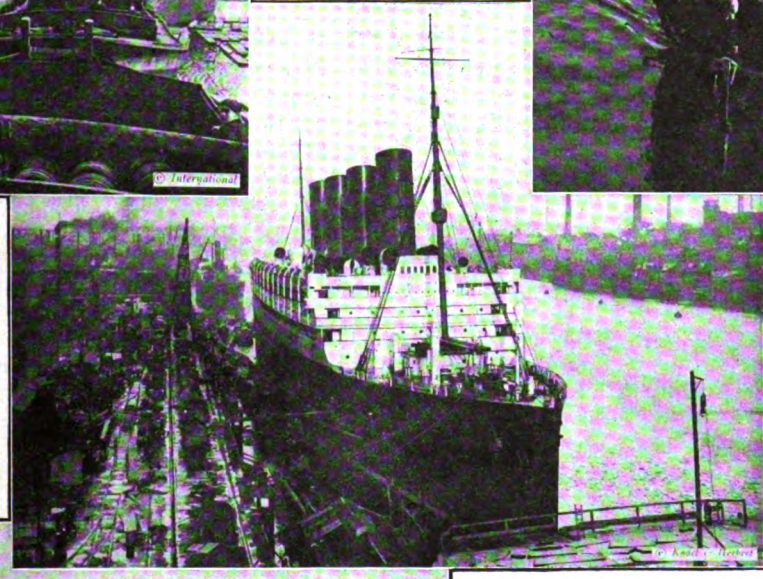
Latest Marine News in Pictures



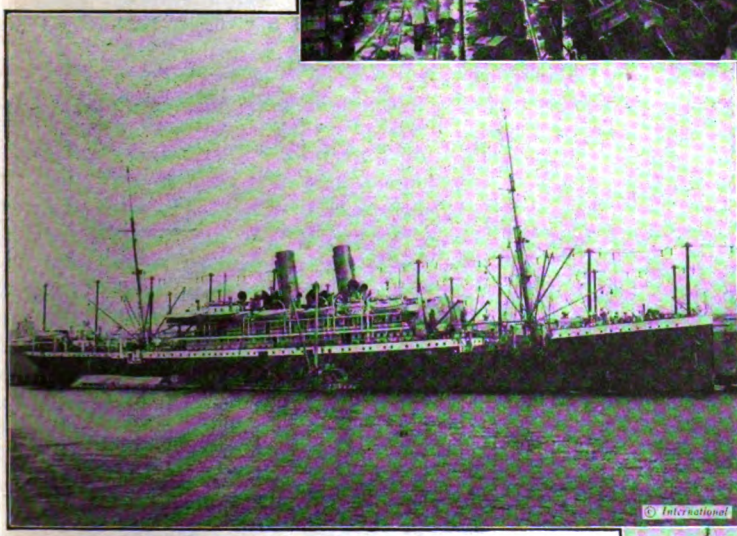
More than eleven billion dollars worth of imports, including foods and raw and manufactured materials are lying idle on London docks awaiting delivery, owing to rail and labor difficulties. This ship is unloading a cargo of rum



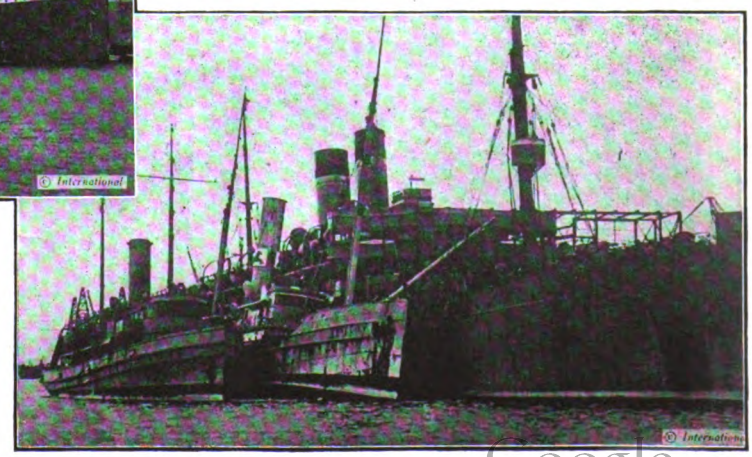
The giant liner Aquitania, dwarfing everything around her, in the shipyard of Armstrong, Whitworth & Co., at Newcastle. She is being altered and equipped to burn oil instead of coal



Shipping in Japan still retains its primitive features, despite the industrial progress of that nation. Export and import material is hauled through canals to and from the sea



Caught in the storm that recently swept the North Atlantic, the U. S. S. Powhatan, army transport, with 271 passengers aboard, reached port in a leaking condition. The White Star freighter, Bardic picked up the steamer 600 miles east of New York, but as her propellers became fouled she was forced to release the tow



The Powhatan was finally towed into Halifax by the American tug Relief, after several days' battle with heavy seas. The Powhatan was formerly the Hamburg of the Hamburg-American line, and came into American possession during the war

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Capt. J. M. Johnston Dies

Capt. J. M. Johnston, who for the past 12 years was fleet captain of the Cleveland-Cliffs Iron Co., Cleveland, died at his home at Rocky River, O., on Jan. 22. Death was due to pneumonia. Captain Johnston was 66 years old. He was born in Sweden and took to seafaring when but 12 years old. He first served in the galley of a small Norwegian steamer in 1867 and by dint of persistent effort he became the holder of an able seaman's certificate in 1870.

In 1872 he came to the Great Lakes, his first berth being that of wheelsman on the Canadian ship EAST, Capt. H. Zealand. Later he was granted original pilot's papers and served as second mate under Captain Zealand on the DROMEDARY. In 1875 he was mate on the COLUMBIA and in 1877, when but 23 years old, he was master of the steamer VANDERBILT.

His career on American lake vessels began in 1883 when he entered the employ of Murphy & Charlton, Detroit. This firm owned tugs that towed schooners through the Detroit river. In 1892 he was master of the Lehigh Valley line's steamer TUSCARORA. From 1895 until the end of 1898 he was in the employ of the late Capt. W. C. Richardson as master of the wooden bulk freighter WILLIAM EDWARDS.

His service with the Cleveland-Cliffs Iron Co. began in 1899 when he was appointed master of the steel steamer PIONEER. He sailed successively for this company the ore carriers FRONTENAC, PONTIAC and PRESQUE ISLE. In 1905, when the company contracted for the building of five new steamers, the WILLIAM G. MATHER, J. H. SHEADLE, MICHIGAN, ISHPEMING and PETER WHITE, he was appointed superintendent of construction.

After these vessels were placed in commission, Captain Johnston sailed the company's flagship, the WILLIAM G. MATHER, during the navigation season of 1907. In 1908 he came ashore as fleet captain after 40 years of service on the water.

River Coal Trade Grows

The value of the Monongahela river as a transportation medium for the Pittsburgh district is evidenced by figures recently made public by the United States engineers' office. It was shown that, starting in 1898, when the government took over the locks and dams in the river, the coal tonnage carried on the Monongahela has increased from a little less than 6,000,000 tons a year to more than 14,000,000 tons in 1919. An average of more than 1,000,000 tons a month are transported on the river and locked through the dams of the stream.

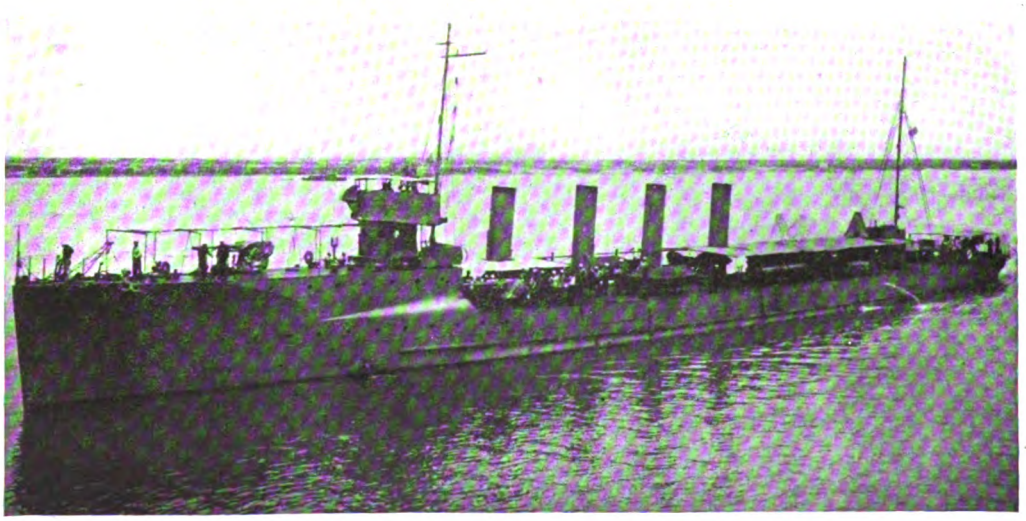
In addition to the coal tonnage carried during the past year, 3,000,000 tons of building material were carried by boat to points along the river. The coal tonnage recorded, it is said, would have been 1,000,000 tons greater last year if it had not been for the coal strike and also because the ice in December held up traffic.

Coal tonnage on the river has steadily increased for 5-year periods except in 1908 when the figures were lower than for the previous period. The coal tonnage in 1898 was 5,750,000; in 1903, 10,000,000; in 1908, 8,100,000; in 1913, 10,250,000, and in 1918, about 13,000,000. It is too early in the season to predict figures for 1920.

To Give Timely Hurricane Warnings

AT THE present session of congress the United States weather bureau is presenting a bill providing an appropriation for the use of three or four fast steamers to patrol the Gulf of Mexico against hurricanes. In the past 10 years these storms have caused hundreds of millions of dollars damage to shipping on the Gulf and to settlements all along the coast, from Key West, Fla., to Brownsville, Tex.

The idea is that of C. F. Marvin, chief of the bureau, who has been considering the plan for some time. Recently he made a trip of inspection to the many stations of the weather bureau along the Gulf coast, studying the situation. So efficient has become the general system of warnings of hurricanes that loss of life and property on the shores of the Gulf has been reduced greatly and shipping has been saved scores of vessels and hundreds of thousands of dollars every hurricane season. This season extends, roughly, from the end of August to the end of October. The storms are always severe.



Old type torpedo boat destroyer which it is proposed to utilize in obtaining hurricane warnings on the Gulf of Mexico.

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This efficiency, however, has worked, in a way, a detriment to the weather bureau. Shipping is so well warned that all the vessels remain in the Gulf ports until the hurricane is past, or those few who are caught in it, either have no wireless, or that wireless, being the most exposed of all the ship's machinery, is sometimes destroyed as soon as the storm hits the vessel. It is impossible, therefore, to get accurate information of the position, direction, speed, power or destructive ability of the hurricane after it enters the Gulf since so few ships in the path of the storm are capable of sending out such data.

The stations along the shore of the Gulf and on the islands of the Carribbean, as well as on the Florida straits and the Yucatan channel, can tell nothing definitely of the storm after it passes over them, inward bound on the Gulf. Definite information thus cannot be obtained to provide warnings for the small inshore boats, the tremendous power boat fleet of the Louisiana fisheries, or for the towns all along the mainland.

Mr. Marvin, therefore, has conceived the idea of using three or four fast boats—probably torpedo boat destroyers of the type in use before the war—which can maintain a speed of 30 miles an hour, and which have powerful radio apparatus. These boats would be stationed at various points along the Gulf, say at Tampa, Fla., at Mobile, Ala., at the mouth of the Mississippi and at Galveston, Tex. As soon as hurricane warnings come in from the Caribbean, these swift vessels would shoot out, pick up the hurricane, wireless in its size, velocity, strength, direction and speed, telling all the Gulf weather stations and each other all obtainable data on the storm. Thereafter, these hunters of the hurricane would hang around the rim of the storm, following it until it struck inland, or, as often happens, it turned about on itself and went back out to the Atlantic.

The source of these terrific storms is not exactly known, but meteorologists believe they originate between the Canaries and the coast of Africa. All appear to come from the part of the Atlantic ocean. The cost of the ships used as a patrol, it is estimated, would be more than repaid during the first hurricane season in property saved in the mainland settlements of the Gulf coast alone. From that time on, the maintenance of this little fleet would be as nothing compared to the annual saving. Gulf coast mariners indorse the plan as practicable.

F. Holbrook 1861-1920

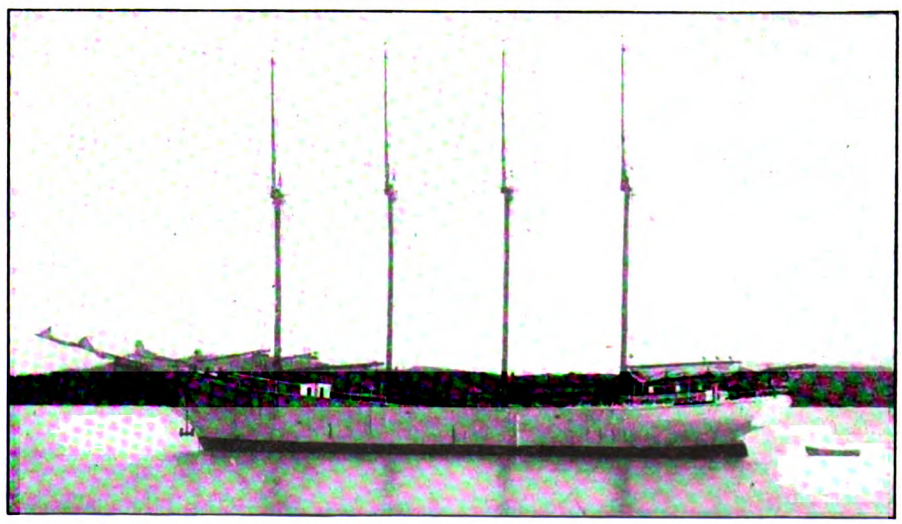
Frederick Holbrook, aged 59, vice president of the American International Corp., New York, died in Paris after a short illness, according to word received by the company on Feb. 6. He had sailed from New York last December to visit Russia in the interest of the Grace-American International Corp., of which he was elected president at its formation last year. Soon after becoming vice president of the American International Corp., in 1916, Mr. Holbrook went to Russia in its interest. During 1918, he had charge of the Hog island shipyard, Philadelphia, as president of the American International Shipbuilding Corp. He also was president of the Holbrook, Cabot & Rollins Corp., which constructed buildings and railroads in the United States and Mexico. He was born in Lynn, Mass., in 1861.

Rebuilds Schooner Burned in War

OVER a year ago the charred hull of the auxiliary 4-mast schooner DORNFONTEIN was towed into Eastport, Me., harbor and taken up the Denny's river, 18 miles away. She had been bought for $5500 by Pushee Bros., shipbuilders, Dennysville, Me., together with about 300,000 feet of heavy lumber or board. Early in November, 1919, the reconstructed ship again reached Eastport harbor, under the name of NETNESTON of New York. She is built on the same style, is 185 feet length, 40 feet beam, 14 feet 3 inches deep and of 700 net tons.

The DORNFONTEIN was launched June, 1918, at St. John, N. B. The vessel cost $110,000, and with her cargo of 900,000 feet of lumber started off on her maiden trip to Africa. She represented a value of over $200,000. During August, 1918, when far down the Bay of Fundy she was overtaken by German submarine No. 56 and after the valuables had been removed and the six months provisions taken off, the Hun sea raiders set the schooner afire, taking the crew of nine on board and landing them on Grand Manan island. Two days later the Canadian fishermen of Grand Manan were attracted to the burning schooner and taking her in tow beached her on Grand Manan and put out the fire. About 400,000 feet of lumber was saved and later part of it was sold. The hull, burned close to the water line, was brought to Eastport.

The NETNESTON started on her "second maiden voyage" early in November, 1919, for Norfolk, Va., under command of Captain Jasper, Machias, Me. She has electric lights, toilet and bath, finely furnished and finished cabins, and is equipped with a 35-horsepower gasoline engine for hoisting the anchors and sails. Two stockless anchors of 400 pounds each and 200 fathoms of chain are carried. The NETNESTON is typical of the fore-and-aft rigged craft that have found favor among Atlantic coast shipping men. Under full sail in a fair wind she can easily make ten knots an hour, loaded, with the wind abaft her beam. Her hoisting engine is an innovation that is being adopted on craft of this type. Its use eases long hauls and, unlike the donkey engine of other days, it is always ready for use without waiting to get up steam.



FOUR-MAST AUXILIARY SCHOONER, THE NETNESTON, VICTIM OF HUN PIRACY, RECENTLY REBUILT

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Marine News in a Personal Way

Intimate Gossip About What Leaders in the Maritime World Are Doing

G. A. TOMLINSON, at a recent meeting of the Buffalo Dry Dock Co., which operates the Buffalo plant of the American Shipbuilding Co., was elected president to succeed EDWARD N. SMITH, who resigned. JAMES CAREY EVANS, president of the Great Lakes Transit Corp., and M. E. FARR were elected vice presidents. The number of directors of the company was reduced from seven to five and MR. TOMLINSON, JAMES E. DAVIDSON, ALFRED G. SMITH, H. S. PICKANDS and M. E. FARR were elected members of the board. Mr. Tomlinson is a member of the executive committee and a director of the American Shipbuilding Co., and president of the Superior Shipbuilding Co. He also operated a fleet of steamers and broker's offices in Cleveland and Duluth. Mr. Tomlinson has been director of inland waterways for the United States railroad administration for the past two years but he has resigned that post to enable him to devote his entire time to his other interests. Formerly he was a newspaper man. He has been connected with Great Lakes vessel operations for the past 30 years.

* * *

ARTHUR B. LAFAR has resigned as traffic manager of the States Marine & Commercial Co., Inc., New York, to enter the employ of the Kerr Steamship Co. of that city. Mr. LaFar has charge of the company's South American department.

* * *

DAVID C. REID, New York, well known ship broker, has become New York agent of Gernandt & Cedarvall, ship brokers and chartering agents, Stockholm, Sweden.

* * *

P. C. KENYON, who was traffic manager for Harriss, Magill & Co. for several years, has joined the staff of the Black Diamond Steamship Corp., agents for the Union Suisse de Transports Maritimes.

* * *

RAYMOND K. WEINS recently was appointed assistant to Chairman Payne of the shipping board. Mr. Weins was formerly treasurer and secretary of the Racine Mfg. Co., Racine, Wis., and during the war he was a captain in the signal corps of the army. In this capacity he acted as aide to General Salzman.

* * *

WILLIAM V. PIDGEON, assistant manager, European trades department of the United States shipping board, has resigned.

* * *

M. J. AUTH recently was elected vice president and treasurer of the Gardner Shipping Co., Inc., New York, foreign freight forwarder, marine insurance and ocean freight broker. Previously to joining the Gardner forces, Mr. Auth was Oriental traffic manager for Arkell & Douglas, Inc.

G. A. TOMLINSON

* * *

JAMES J. MURPHY has joined the firm of M. Harrison & Co., Inc., New York. He will have charge of the foreign forwarding department. Formerly Mr. Murphy was connected with the Edgar Shipping Co.

* * *

JOHN GOODWIN, who formerly was connected with the Barber lines, is now directing the business affairs of the Atwater Shipping Co., New York. The Atwater company is an American organization that handles American registered vessels at European and Mediterranean ports. One of the company's activities is the securing of return cargoes.

* * *

CHARLES MARRA, formerly connected with Norden, Holt & Marra, stevedores, has withdrawn from that firm to become president of the Liberty Stevedore Co., New York.

* * *

JOHN D. NEEHAN has been made head of the outward department of the Barber lines. He succeeds AARON HOUTMAN who retired recently.

* * *

C. C. TORPEY was re-elected president of the Export Steamship Corp., New York, at its recent annual meeting. L. S. HELLEBRAND was elected secretary and treasurer, while CAPT. FRANK E. FERRIS was elected vice president and general manager. JAMES BENTLEY was re-elected chairman of the board of directors.

* * *

F. B. RICHARDS was elected president of the Lake Superior Iron Ore association at its recent annual meeting. Other officers elected at this meeting are: H. G. DALTON and R. C. ALLEN, vice presidents; H. S. STEBBINS, treasurer, and W. L. TINKER, secretary.

* * *

CAPT. LEE DE NIKE was elected grand president of the International Shipmasters' association at its recent annual meeting held in Toledo, O. Other officers elected at the meeting are: CAPT. F. B. SLATER, first vice president; CAPT. JOSEPH ACTON, second vice president; CAPT. F. B. MUGLER, secretary, and CAPT. JOHN C. BAIRD, treasurer.

* * *

GEORGE FREITAS was re-elected grand president of the Licensed Tugmens' Protective association at its recent annual meeting held in Chicago.

* * *

JOHN F. CONDON was elected president of the Great Lakes and St. Lawrence river passenger committee at its recent meeting held in Montreal. At the same meeting, A. E. STOREY was elected secretary. Mr. Condon is general passenger agent of the Great Lakes Transit Corp., while Mr. Storey is rate clerk for the Grand Trunk railroad.

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Marine News in a Personal Way

Intimate Gossip About What Leaders in the Maritime World Are Doing

WLE ROY EMMET, a pioneer in the development of electric propulsion for ships, recently was awarded the Edison medal for 1919. The citation adds: "For meritorious achievement in electrical science, electrical engineering and the electrical arts." Mr. Emmet who makes his home in Schenectady, N. Y., was born in Pelham, N. Y., in 1859. He entered the United States naval academy after completing a high school course and graduated from that institution in 1881. He served as a cadet midshipman until 1883 at Annapolis and on board the U. S. S. Essex. He re-entered the navy as a junior lieutenant in 1898 and served as navigator on the U. S. S. Justin during the Spanish-American war. For a number of years he has been consulting engineer for the General Electric Co. One of his recent notable achievements was designing the propulsion machinery of the battleship New Mexico. This vessel was the first warship of any nation to be equipped with electric propulsion machinery. Later the U. S. S. California, launched recently in California, was equipped with propulsion machinery of Mr. Emmet's design as is also the collier Jupiter.

* * *

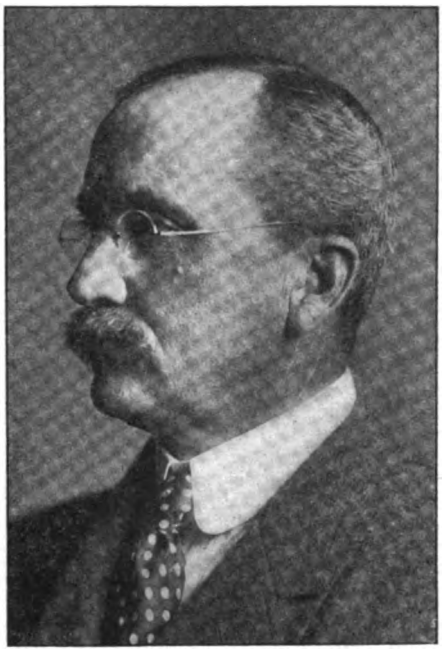
George J. McCarthy, city passenger agent at San Francisco for the Pacific Steamship Co., has been appointed the company's chief passenger agent in the Orient with headquarters in Shanghai, China. Mr. McCarthy will cross the Pacific with John J. Gorman, general Oriental agent, who is returning after a conference at the head offices in Seattle. Mr. McCarthy will perfect an organization in the Far East in anticipation of the inauguration of fast passenger service by the Pacific Steamship Co.

* * *

F. M. Studley, after completing service for the Nippon Yusen Kaisha in Seattle over a period of 22 years, has returned from Japan where he presented his resignation as Seattle manager at the head office. Mr. Studley has been succeeded by M. Watanbee, who has been submanager at Yokohama. It is understood that the N. Y. K. recognized Mr. Studley's long service with a substantial bonus. He will take a well earned rest. For 14 years Mr. Studley represented the steamship company in connection with the Great Northern railroad and for the last eight years he was the Japanese line's Seattle manager.

* * *

Edwin O. Chase has been appointed president of the chamber of commerce of Providence, R. I., and has also been appointed by Governor Beckman, of Rhode Island, to represent the state on the New England foreign and domestic commerce committee which has been formed for the purpose of furthering the interests of New England ports. One of the chief aims of the new commission is to secure more equal distribution of American ships among the ports of the United States.



W. LE ROY EMMET

* * *

James E. Pharo, identified with north Pacific shipping interests for years, has returned to the general brokerage and marine field. Mr. Pharo was one of the organizers of the Alaska Coast Co., now a unit of the Pacific Steamship Co. Later he was with the Pacific Coast Co. but for two years has been in shipping board service.

* * *

Louis K. Thurlow, treasurer and director of the Crowell & Thurlow Steamship Co., Boston, has been made a director of the Second National bank, Boston.

* * *

Robert E. Peabody, vice president of John S. Emery Co., Inc., has resigned to enter the service of Rogers & Webb, which concern is about to enter the foreign steamship business out of Boston.

* * *

Elvin M. Woodworth, for 16 years connected with the foreign freight department of the Boston & Albany railroad at Boston, has been appointed manager of the Boston office of the Mutual Shipping Service, Inc.

O. W. Blodgett recently was elected president of the Lumber Carriers' association at its recent meeting held in Detroit. Other officers elected are: Edward H. Thomas, first vice president; F. P. Potter Jr., second vice president; Herman H. Hettler, third vice president, and Capt. C. H. Weeks, secretary and treasurer.

* * *

John W. Woodfill has been appointed agent for M. A. Hanna & Co. at the head of Lake Superior. Mr. Woodfill formerly was connected with the Pittsburgh Steamship Co.

* * *

Alba B. Johnson was elected president of the Philadelphia chamber of commerce at its recent annual meeting. Charles P. Vaughan, A. C. McGowin, William A. Law and Howard B. French were elected vice presidents, N. B. Kelley was re-elected general secretary, while Richard L. Austin was elected treasurer.

* * *

T. H. Roberts has resigned as member of the board of commissioners of the port of New Orleans. He is vice president of the Sterns Foundry & Machine Co., and gave pressure of personal business as his reason for resigning from the dock board. His successor has not been named.

* * *

M. P. Billups, director of operations for the United States shipping board's gulf division, has resigned, and G. H. Keene, manager of the tug and barge department of the shipping board, has taken Mr. Billup's place.

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Late Decisions in Maritime Law

Legal Tips For Ship Owners and Officers

Specially Compiled for The Marine Review
By Harry Bowne Skillman
Attorney at Law

IN THE case of Firemen's Fund Insurance Co. v. Trojan Powder Co., 253 *Federal Reporter* 305, the contract of affreightment considered authorized the carrier in case of stranding to forward by another ship and charge extra compensation therefor, which contingency happened. It was held that the cargo insurer, which, although exempted from particular average, contracted to pay special forwarding charges, was liable for the extra cost of forwarding. It was also decided that a clause of a marine cargo policy, "Freight warranted free from any claim consequent upon loss of time, whether arising from peril of the sea or otherwise," does not apply to excess freight paid for forwarding on the stranding of the ship.

* * *

Article 16, international rules of the sea (act Aug. 19, 1890, chapter 802, 26 statutes at large 320), providing that "Every vessel shall, in a fog, mist, falling snow, or heavy rainstorms, go at a moderate speed, having careful regard to the existing circumstances and conditions," was under consideration in the case of BEAVER, 253 *Federal Reporter* 312, a suit for collision. It was contended that under this rule, "no matter what the other circumstances may be, nor how low soever the maximum rate of speed of a vessel may be, she must, in face of any one of the atmospheric conditions specified in the rule, reduce her speed below its maximum point or be necessarily held in fault in case of collision; that, in other words, 'moderate speed,' as there required, necessarily means less than full speed, and that a vessel going at full speed in such conditions of weather is violating the rule, no matter how slow that speed may be, and is guilty of negligence as matter of law." The court did not accept this interpretation of the rule, but held that what is a moderate speed must depend upon the situation and the circumstances. "Not only is this construction of the rule to be deemed to have been in the mind of congress when it later adopted its language," said the court, "but it is in harmony with the views subsequently expressed by the courts of this country."

* * * *

The sum of $4000 was awarded in the case of JELLING, 253 *Federal Reporter* 381, to a steamship worth, with her cargo, $2,700,000, for the rescue of a schooner and cargo worth $12,000, from a point 50 miles off the North Carolina coast. In making the award, the court said, "While the actual expense incurred, or loss of time by the JELLING, do not constitute claims for which payment may be demanded, they are items to be considered. * * * While the salving vessel is to be rewarded liberally for salvage service, because of the risk which she takes of receiving nothing, if unsuccessful, she also takes the risk of error in the valuation which she places on the vessel saved." The amount of $40,000 was awarded in the case of FORDENSKJOLD, 253 *Federal Reporter* 273, for floating a steamer worth, with her cargo, $1,000,000, which had stranded off the Florida coast at a dangerous season, although the weather was fair. In the case of MAGNOLIA, 253 *Federal Reporter* 400, the award to a power boat worth from $4000 to $5000, which rescued and took in tow a gasoline schooner worth between $8000 and $10,000, was the sum of $750. A steamer worth $300,000, which towed a bark worth approximately $90,000, carrying a cargo worth $45,000, which had stranded on a Florida reef, was awarded $30,000 as salvage, with an additional $2000 for injury to its cables, in the case of PORTUGAL, 253 *Federal Reporter* 264.

* * *

It was said in the case of MIDDLESEX, 253 *Federal Reporter* 142: "Of course, a sailing vessel cannot stop and reverse like a steamer. Her only method of avoiding obstacles ahead is by a change of course. Below a certain speed, a long, heavily laden vessel * * * loses almost completely her ability to maneuver. She must maintain such speed * * * as will enable her to change course effectively if danger arises. The point at which that rate is exceeded by any particular vessel at any given time is a matter of judgment, depending on many things. Even with steamers it is not uniform; much greater differences must be allowed for in sailing vessels." The court then held that a speed of four knots through the water, by a long and heavily laden schooner at night in a fog, was not excessive, such speed being necessary to give her steerageway; further, that the fact that a schooner at sea did not sound her whistle or exhibit a flare at night in a dense fog was not a fault contributing to a collision with a meeting steamship, where she was sailing free and her fog horn was sounded at proper intervals.

* * * *

What price may the owner of a boat charge for supplies furnished for a cruise? The question was answered in the case of MARIO MARIOFEL, which is reported in 253 *Federal Reporter* 289, where the court said: "I gather from the testimony that the owner of the boat was a merchant * * * furnishing the supplies from his stock, such as he had, and purchasing from others such as he did not have. It is well known that merchants purchasing from others receive what is called a trade discount, so as to permit them to supply their customers at a profit to themselves. Now, the testimony shows that the articles, whether purchased from the store of the owner or procured from other merchants, were furnished to the boat at the market price. This is all that the crew could reasonably require.

* * *

While a ship is bound to a high degree of care for the safety of a passenger, it was held in the case of GREAT NORTHERN, 251 *Federal Reporter* 826, that the passenger is also required to exercise reasonable care for his own safety. The facts in such case showed that a passenger, a man of 47 years of age, who had been in the plumbing supply business, and had dealt in materials such as that of which the floor of the bath room of the ship was constructed, was injured by falling on the bath room floor. The court, in holding that such passenger was not entitled to a recovery, said that "He must have known, as everyone who takes a bath knows, that such enameled ware is smooth, and when wet is slippery. He saw that the floor of the shower bath was wet. He had opportunity to observe, and must have seen, what handholds there were. The whole situation was visible to him, and there were no latent defects. He knew that a ship at sea was likely to lurch. He knew that stationary bath tubs were available for his use. He chose to use the shower bath, and he assumed whatever risk its obvious condition subjected him to."

* * *

The following propositions were laid down in the case of HELEN FAIRLAMB, 251 *Federal Reporter* 412:

(1) When the pay is for the run or for the voyage, generally speaking, nothing is earned unless the voyage is completed.

(2) If the voyage is interrupted by a peril of the sea, so that it can not be completed, the men are released from service and have the right to their discharge.

(3) When the voyage is unfinished, because of perils of the sea, if no benefit has been received by the vessel, no wages have been earned.

(4) If, however, the ship has been benefited by services so far as rendered in part, the seamen are entitled to pay on an equitable basis.

(5) When the crew are entitled to their discharge, because the voyage cannot be completed by reason of a peril of the sea, they may be hired for further or different services, and are to be paid as agreed, and, if no rate of pay is mentioned, may recover on a *quantum meruit*.

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Expand Plans for Marine Show

Demand for Space Necessitates Engaging Entire Grand Central Palace — Exhibits to Cover All Phases of Maritime Import

PLANS for the National Marine exposition to be held at the Grand Central palace, New York, April 12-17, have been extended materially beyond the original scope, giving adequate indication that this event will prove of permanent value to the marine field. Already exhibitors have bought up the space offered on the first two floors and it is confidently anticipated that all four floors of the enormous exhibition building will be filled with exhibits of American inventions and industrial activities connected with marine work. The sponsors of the exposition have promised to receive new exhibitors up to about three weeks prior to the opening provided any space is available at that latedate. The United States shipping board will be represented by an elaborate three-part exhibit which will depict graphically all phases of the shipping board's work since its inception. A special committee to prepare the exhibits has been appointed by Chairman Payne. Official co-operation of the shipping board has been further extended by the consent of Chairman Payne to open the exposition in person. The department of commerce will be represented by exhibits of the steamboat inspection service, the bureau of navigation, the bureau of fisheries, the bureau of lighthouses and the coast and geodetic survey. Important features of the department of commerce's exhibit will be lifeboats required by the steamboat inspection service on all passenger vessels; fog horns, lamps and lenses employed in the service of the bureau of lighthouses; models of old-time fishing and whaling vessels and instruments side by side with modern vessels and equipment employed in the fishing industry of both the Atlantic and Pacific coasts; and a remarkable radio compass just perfected by the bureau of standards for the bureau of navigation. Moving pictures of the United States government's seal herds in the Bering sea will be shown in connection with the exposition. One remarkable scene shows 6000 seals taking to the water at one time.

"I am sure the American people do not realize fully the value to our commerce of a great American merchant marine," said Joshua W. Alexander, secretary of commerce, in giving his endorsement to the forthcoming exposition. "The celebrations and demonstrations thus provided for at the National Marine exposition in connection with national marine week will have a great educational value and should arouse the entire country to take a deep interest in this great question, not alone from a sentimental standpoint but from a practical business standpoint." Three months before the exposition is scheduled to start, practically 100 firms and organizations had contracted for space at the exhibit. These exhibits alone will cover at least 4000 square feet of space. One interesting feature will be the presence of some of the stronger American steamship lines. While this is the first marine exposition held in the United States within 20 years, similar expositions abroad have been conspicuous by the absence of operating steamship companies. The foreign expositions have been

P. H. W. ROSS, PRESIDENT OF THE NATIONAL MARINE LEAGUE

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given over primarily to shipbuilders and manufacturers of supplies. The international Mercantile Marine, the United States Steamship Co., and the Luckenbach line are among the American operators who have already indicated their intention to share in the exhibition. Tentative plans for the decoration of the exhibition halls call for the flying of house flags of all American steamship companies.

Will Show Submarine

Simon Lake will exhibit his submarine as well as his newer inventions to salvage sunken cargoes. Other recent and important inventions will be shown, many of which are but slightly known to the general public.

Labor will not be neglected, several of the organizations of the men who follow the sea having signified their intention to be represented. Among these will be the Neptune association, an organization of American masters and mates; the National Marine Engineers' Beneficial association, and the Shipmasters' club. The Travel Club of America and the American Bureau of Shipping will have exhibits. In fact, practically all phases of ocean transportation will be adequately represented.

One of the unique exhibits will be displayed by the American Library association. This was the organization which attempted to supply the American sailors and soldiers with reading matter during the war. Since the war, the organization has been working to place suitable libraries on board the American merchant ships. According to present plans, the Library association will exert an effort to exhibit a shelf of books relating to the sea which have been selected as the best of all published works on this and related subjects. The selection of the books for this shelf will probably be left to popular vote.

Capt. Arthur N. McGray, secretary of the Neptune association, has promised that all American masters and mates will give due attention to the celebration in New York, although they may happen to be scattered to all the ports of the world. Captain McGray is the chairman of the merchant mariners' committee for the celebration and he plans to have the merchant mariners in every port of the United States hold simultaneous luncheons and has proposed the exchange of wireless messages from masters of American vessels on the high seas at that time. In conjunction to this a ringing "call to the sea" will be made to the young Americans in every state of the union by proclamation by the maritime personnel organizations throughout the country.

"To bring American boys back to the seafaring professions is one of the chief objects of national marine week," said a statement issued by Captain McGray's committee. "The nautical training schools of New York, Massachusetts, Pennsylvania, California and Washington and the United States shipping board's school ships and training stations will co-operate with the various mariners' organizations in bringing home to the American boys the increasing importance, responsibilities and dignity of the seafaring profession. The time when American ships are officered and manned by Americans must come again. It is the purpose of the merchant mariners' celebration to bring the boys of non-maritime states 'down to the sea and ships' in numbers so large that the American merchant marine shall be established so far as its personnel is concerned on a permanent basis of development."

The New York committee for merchant mariners' day consists of Chairman, Capt. Arthur N. McGray, secretary of the Neptune association; Capt. Reginald Fay, secretary of the New York State Nautical School Alumni; Capt. Irving L. Evans, chief of the United States shipping board recruiting and sea service bureau; Thomas Healey, secretary of the Marine Engineers' Beneficial association, No. 33; Capt. Robert Huntington, director of the navigation school of the Seamen's Church institute; Dr. George S. Webster, secretary of the American Seamen's Friend society; Capt. John H. Pruett, secretary of the American Association of Masters, Mates and Pilots; Capt. A. B. Conner, president of the Ship Masters' club.

Receives Wide Indorsement

Some of the most influential personages in the American marine field have already indorsed the exposition and signified their intention to lend it all of their support. The pure business reasons for this action furnish only a portion of the reason for this support. These leaders have foreseen that the exposition can be used as a powerful agency for propaganda and have lost no time in sanctioning it for this purpose.

"It is my opinion that you are on the right track," writes R. T. Crane Jr., president of the Crane Co., Chicago, "and that you have a splendid opportunity to center the attention of the people of the country on the necessity and importance of having an American merchant marine. Our ships should sail the seven seas in ever increasing numbers if we are to maintain our standing among the nations of the world."

A similar indorsement has been given by Holden A. Evans, president of the Baltimore Dry Docks & Ship Building Co.

"I am glad that the plans for the national marine exposition will be realized in the week beginning April 12," said A. C. Bedford, of the Standard Oil Co. "The United States finds itself in possession of a huge fleet of American-built ships without a clearly defined program of operation. It is vitally important to the nation that we do not let the opportunity afforded by the accident of war to regain our rightful position as a maritime country slip through our fingers for lack of appreciation on the part of the public of the value of a real American merchant marine. I am sure that the exposition will do a great deal to inform people of the continued efforts necessary to maintain the position on which we have but a very precarious hold at the present moment."

To Lend Valuable Support

Men of moment and of diversified business interests have consented to pause long enough to lend their support to the exposition, realizing that it will undoubtedly be a tangible means of bringing home to a vast populace the importance of ocean shipping at this critical political time. "There is no question of the need for continuing efforts to educate the American public to take a definite, practical interest in the problem of the American merchant marine and the development of our overseas trade. Anything that assists in this worthy cause, you may be sure will have my sympathy." In such manner has W. Averill Harriman declared himself. As the son of the great railroad magnate, Mr. Harriman has already made himself a power in the ocean transportation world in a comparatively short space of time.

How far the marine exposition can be or will be used as a propaganda movement to interest the public in the merchant marine problem cannot definitely be forecast at this time. The interest so far displayed and the plans drafted indicate that it will likely be greatly extended. The fact that the exposition and the celebrations concommittantly planned come but a short time prior to the holding of the great party presidential conventions is a matter worthy of noting in this connection.

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Expect Brisk Trade During 1920

Lake Carriers at Annual Meeting Disclose Optimism Concerning New Year's Operations—Discuss Welfare of Sailors

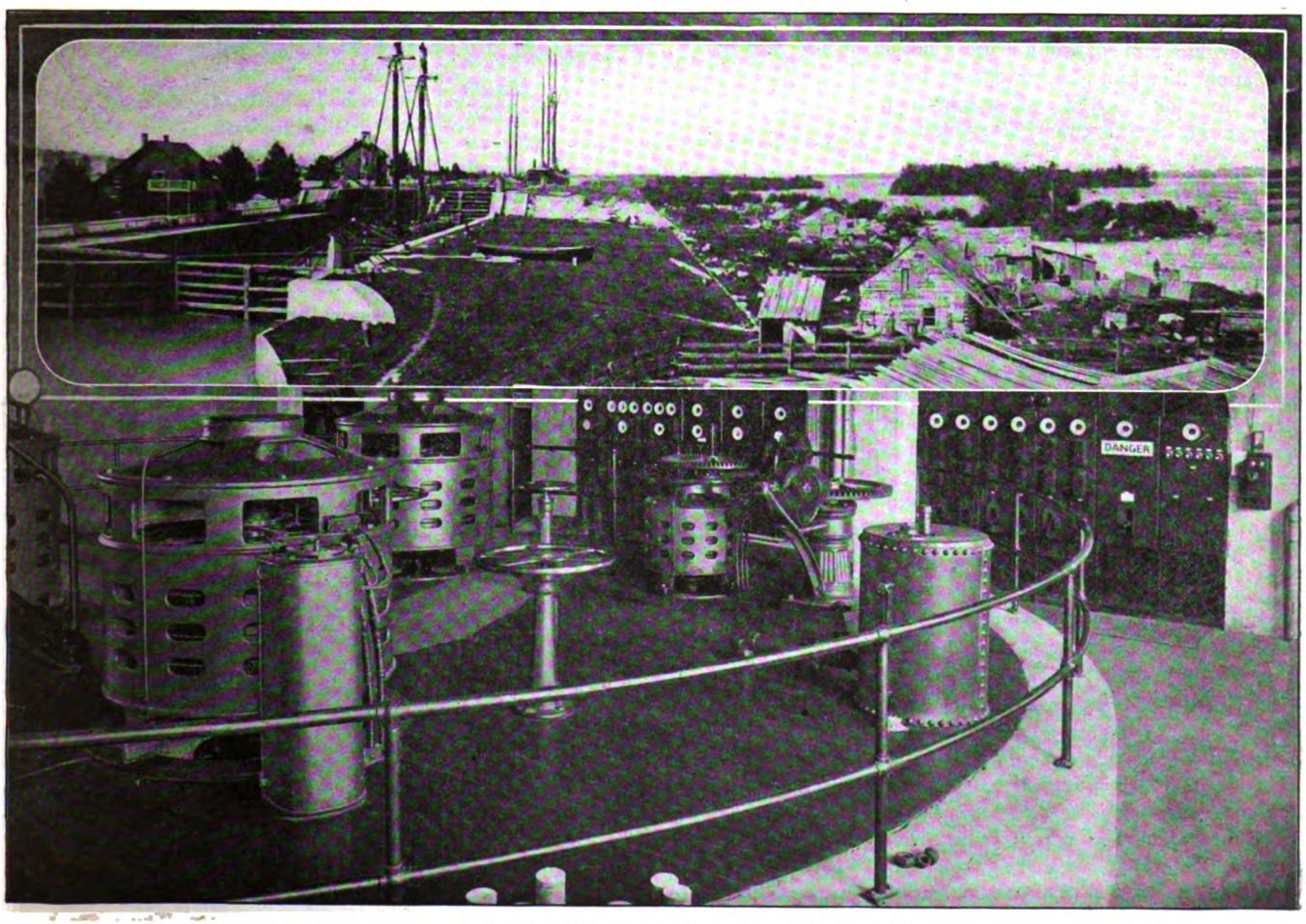
CONVICTION that 1920 holds promise for improvement in operating conditions pervaded the annual gathering of operators of bulk freighters on the Great Lakes at Detroit, Jan. 15. Optimism originates partially in the relief felt that 1919 with all of its threatening phases of industrial disturbances, proved no worse than it did. Last year presented an almost continuous series of restrictive barriers to efficient vessel operation on the lakes but in many cases these obstacles proved less serious when they were actually being surmounted. The vessel operators at the annual midwinter meeting were clearly influenced by the success they had won last year in satisfying the demands of the bulk freight trade.

Another influence which is giving rise to confidence as the new season of navigation draws closer, is the gaining impression that general industry will draw heavily upon the basic trades of the country during 1920. This, of course, will sustain a constant demand for bulk freight such as iron ore, coal, grain and stone.

The Detroit gathering was the annual meeting of the members of the Lake Carriers' association and of the Great Lakes Protective association. At the two sessions of the lake carriers, William Livingstone, president of the association, presided, being assisted by J. S. Ashley, vice president; Harvey D. Goulder, general counsel, and George A. Marr, secretary-treasurer. More than 96 per cent of the tonnage operated by the association's membership, which includes practically all operators of bulk freight fleets, was represented.

President Livingstone in his annual report discussed the obstacles which the operators had been forced to meet duing 1919. Abstracts from his report are presented on following pages. The retention of certain methods developed during the war was partially responsible for the ability of the vessel men to make 1919 a year of successful performances. In particular, President Livingstone gave credit to the mobilization plan. Under this plan, the lake operators had been able throughout the war to satisfy every call made upon them either by the government or by private industry, a record of special importance since the lake lines were the only vital transportation agency in the country which was not taken over and operated by federal authorities. Various of the benefits of the mobilization plan were disclosed in the operations during 1919.

Another echo of war methods was heard when the lake carriers unanimously adopted a resolution in favor of continuing the coal exchange. This agency was established three years ago and furnishes a centralized or-



TOP OF PUMP WELL AND MOTORS FOR 30 AND 10-INCH PUMPS AT THE THIRD LOCK PUMP HOUSE, SAULT STE. MARIE, ARE SHOWN IN THE LOWER ILLUSTRATION WHILE THE UPPER VIEW GIVES AN EXCELLENT IDEA OF THE SOO LOCKS HALF A CENTURY AGO

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ganization through which the exchange of coal from land to water carriers can be most efficiently directed. The lake carriers in their resolution urge upon the coal-carrying railroads, after their release from government control, the advisability of continuing this exchange on account of the great convenience it has proved to be for coal shippers, railroad and vessel operators.

Much of the business sessions were devoted to discussions of plans for maintaining and bettering the welfare of the sailors and of means for promoting their safety. Last year, safety committees were inaugurated on lake ships and proved highly successful in sustaining the interest of the sailors in safety problems. Reports of the committees on industrial aids to navigation and on welfare will be distributed on the boats. Herbert K. Oakes, in charge of safety work, expressed the belief that this is growing to a point where a safety director will be required. Upon the suggestion of various members, including Harry Coulby and J. S. Ashley, favorable action was taken calling for the payment of $5 a month extra to all men below the grade of licensed officers who remain aboard the boats from the time they fit out until they are laid up. Mr. Coulby also discussed the development of submarine sounding apparatus and its important relation to the safety of navigation. George M. Steinbrenner, chairman of the savings plan committee, disclosed that a gain of $100,000 was made during 1919 in the amount banked by sailors who are taking advantage of the savings plan fostered by the lake operators.

William Livingstone was re-elected president, all of the officers being re-elected. These include J. S. Ashley, vice president; Harvey D. Goulder, general counsel; George A. Marr, secretary-treasurer, and A. R. Rumsey, shipping commissioner.

John J. Boland, Buffalo, was elected a member of the executive committee to succeed the late Capt. W. C. Richardson. The other members of the committee, all of whom were re-elected, include William Livingstone, J. S. Ashley, Harry Coulby, H. S. Wilkinson, C. D. Dyer, G. A. Tomlinson and C. L. Hutchinson. Capt. Fred A. Bailey, Cleveland, marine superintendent of the Pittsburgh Steamship Co., was elected a director of the association to succeed the late Captain Richardson.

Board of Directors

J. S. Ashley	*Cleveland*
H. Coulby	*Cleveland*
John Mitchell	*Cleveland*
H. D. Goulder	*Cleveland*
W. D. Becker	*Cleveland*
Walton H. McGean	*Cleveland*
A. F. Harvey	*Cleveland*
H. K. Oakes	*Cleveland*
Geo. M. Steinbrenner	*Cleveland*
F. I. Kennedy	*Cleveland*
J. Burton Ayers	*Cleveland*
W. G. Stewart	*Cleveland*
John T. Kelly	*Cleveland*
A. E. R. Schneider	*Cleveland*
C. C. Canfield	*Cleveland*
Chas. O. Jenkins	*Cleveland*
W. M. Williams	*Cleveland*
R. D. Mitchell	*Cleveland*
A. T. Kinney	*Cleveland*
A. W. Thomson	*Cleveland*
W. P. Schaufele	*Cleveland*
C. L. Hutchinson	*Cleveland*
E. C. Collins	*Cleveland*
G. B. Houseman	*Cleveland*
George H. Warner	*Cleveland*
C. J. Peck	*Cleveland*
George A. Marr	*Cleveland*
Fred A. Bailey	*Cleveland*
A. C. Sullivan	*Chicago*
H. F. Hughes	*Chicago*
W. Livingstone	*Detroit*
J. J. Boland	*Buffalo*
J. B. Rodgers	*Buffalo*
G. A. Tomlinson	*Duluth*
D. W. Stocking	*Duluth*
Howard L. Shaw	*Bay City*
H. S. Wilkinson	*Syracuse*
C. D. Dyer	*Pittsburgh*
W. P. Snyder Jr.	*Pittsburgh*
W. H. Smith	*Montreal*

The chairman's annual report disclosed a record of unfavorable results for operations in 1919. Three vessels were lost during the year, including the barge CHICKAMAUGA, the only wooden vessel operated by the association; the composite steamer JOHN OWEN and the big steel freighter D. R. HANNA. Other accidents during the year included 16 strandings, 48 groundings, 40 collisions, and 77 miscellaneous cases of damage, 46 of which were from striking breakwaters, lockwalls, channel banks, bridges, docks or piers. In all, 184 losses were reported to the association during 1919.

The annual report of Mr. Ashley is abstracted liberally on following pages. In the report he emphasized strongly the importance of navigating officers following closely the rules and laws provided for promoting safety.

John T. Kelly, Cleveland, was elected a member of the advisory committee to succeed the late Captain Richardson. The other members of this committee were re-elected including J. S. Ashley, A. E. R. Schneider, C. L. Hutchinson, H. Coulby, C. D. Dyer, H. K. Oakes, John J. Boland, William Livingstone, Peter Reiss and W. H. Becker. Officers will be elected by the advisory committee at a later meeting. The present officers are: J. S. Ashley, chairman; Clarence E. Richardson, assistant treasurer; Harvey D. Goulder, general counsel, and George A. Marr, secretary and attorney in fact.

Report of the Protective Association

AN UNFAVORABLE year's operation was reported at the annual meeting of the Great Lakes Protective association, held at Detroit, Jan. 16. Navigation opened with the most auspicious ice conditions that have prevailed for many years. The season, generally, was free from serious gales as well as from fogs, smoke, forest fires and other things that tend to make navigation difficult. Fluctuation of water levels was fairly normal. It was not necessary to revise the loading drafts so frequently as in many years past. In fact, lake carriers enjoyed a generally favorable sailing season. The movement of freight was below normal and on account of labor disturbances ships were obliged to lay up at various periods more than in other years, and primarily there was little need for haste in the dispatch of our ships to accommodate the commerce of the lakes. But, regardless of these favorable aspects, it would seem that we have suffered more losses than the conditions would warrant. When the loss of the steamer D. R. HANNA is considered and the expenses consequent thereto, the result is not so satisfactory as would at first appear. There is another element entering into the result which

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has had a material influence; that is, the greatly increased costs of repairs, which, we are glad to say, are now being substantially reduced and the prospect for return to normal prices is most favorable.

During the past season the association lost three vessels from its membership. The wooden barge CHICKAMAUGA, laden with a cargo of iron ore, was lost off Harbor beach in a moderate gale on Sept. 12. In the loss of the JOHN OWEN that left Duluth with a cargo of grain on Nov. 11, bound for Midland, Ont., there is quite a different story to narrate. She had a comparatively light cargo and was well fitted for the voyage. She had abundance of power and a good crew. Leaving her port of departure in good weather, she encountered a storm early in the voyage. She passed several places wherein she might have sought shelter, but it is assumed that the master believed his vessel could ride out any storm, so he went on.

The circumstances surrounding the loss of the steamer D R. HANNA have been too widely discussed to warrant any considerable comment here. This vessel was lost 6 miles from Thunder bay light in a dense fog shortly after noon on May 16, together with her grain cargo, making a total loss of about $1,750,000. There can be no better illustration of the result of disobeying the rules of the association and the navigation laws than is afforded by this case. One of the two masters grossly and negligently violated rules. If he had obeyed the rules of the association there could have been no loss.

Owing to the increased cost of repairs and the upward trend of incidental expenses generally, as well as the increase in the number of accidents over previous years, the underwriters advanced the hull valuation for 1919 to $60 a ton. The basis used in the season of 1918 was $56 per gross ton. At a meeting of the advisory committee held April 15, 1919, it was decided to follow the regular underwriters in this basis of value and certificates were issued accordingly. The insurance rate of the underwriters, however, was not advanced, remaining at 3⅛ per cent net. The association followed by naming 3¼ per cent as the rate of initial contribution for the year, being the same basis used since 1915 Certificates were issued at pro rata of the season's rate from date of sailing in 1919, all terminating April 15, midnight, 1920, thereby carrying through the winter season until the normal date of the opening of navigation in 1920.

At the last annual meeting of the association, held in Detroit, Jan. 17, 1919, the suggestion was put forth in the interest of advancing the safety of navigation, that a master's committee be appointed to investigate the more serious accidents This was merely an undeveloped suggestion at that time, but considerable comment came forward on the subject and later, at a meeting on July 8, the subject was again discussed. It was thought, however, that a committee composed of a number of practical shore captains, to investigate the details of each disaster and to report their findings to the advisory committee, would be most beneficial in aiding the committee properly to place the liability of the ships interested, and that out of these reports information might be had which would enable the committee to act more intelligently in the formation of necessary rules to avoid a repetition of each case. While this suggestion has not taken tangible form, it will receive serious consideration for application during the next sailing season and your chairman is confident that in its development most beneficial results will obtain.

1919 Lake Accidents

Collisions	40
Total losses	3
Strandings	16
Groundings	48
Striking bridges, abutments, cribs, docks, breakwaters, piers, channel banks, lock walls, etc.	46
Machinery damage	2
Wheel damage	8
Stress of weather	4
Fire	1
Shoe and rudder damage	1
Struck by unloading rig	1
Mooring damage	4
Settled on bottom	1
Struck obstructions	9
Total	184

The separate courses for lakes Huron and Superior have continued to be a rule of the association during the past season, with beneficial results. It is found that masters are more diligent in following these courses as the safety provided by them becomes more generally recognized by our navigators. While there have been complaints at times, it is a fact that the majority of vessels use these prescribed courses, and this has accounted for the absence of many serious accidents which we feel confident would otherwise have occurred. It is unfortunate, however, that one flagrant violation of the rule was in evidence which resulted in a heavy loss. In a dense fog on May 16 the steamer D. R. HANNA with her cargo of wheat was sunk and the steamer QUINCY A. SHAW was severely damaged. While the details of this case will be fully developed in the trial to determine which ship is liable, it is a fact that either one or the other was not on the proper course, and either one master or the other is, therefore, in violation of the rule setting forth the courses to be followed. While this is the most serious loss the association has suffered, it is hoped that the sacrifice was not in vain and that masters will realize that a repetition is very likely to occur if the separate courses are not followed. There does not seem to be any logical reason in defense of a master's action in not using these courses. The only one that ever has been advanced is that the master does not want the office to tell him how he should sail his ship. Experience has taught us that this is not an intelligent view to take, and it is especially demonstrated in the loss of the D. R. HANNA. If both of these masters had obeyed the rule the accident could not have happened.

In the annual report for the year 1918 there were 174 vessels then in the membership of the association with gross registered tonnage of 930,494.

From these the following vessels were withdrawn during the fiscal year of 1919:

	Gross Tons
Steamer Spokane	2,356
Barge S. D. Warriner	2,279
Barge A. W. Thompson	2,279
Total	6,914

Leaving 171 vessels active in the membership of the association for the fiscal year of 1919, divided as follows:

		Gross Tons
164	Steel Steamers	906,308
3	Composite Steamers	6,067
3	Steel Barges	8,733
1	Wooden Barge	2,472
171	Total	923,580

On the 171 vessels active in the membership during the fiscal year of 1919, we have written 171 certificates, valuation aggregating $54,938,580. Of this the association assumed 25 per cent or $13,734,645.

The above tonnage statement includes all the vessels comprising the membership for the fiscal year 1919, and which tonnage is entitled to representation in matters concerning the association's business for that fiscal year.

During the calendar year 1919 there have been three total losses, viz.:

	Gross Tons
Steamer D. R. Hanna	7,023
Steamer John Owen	2,127
Barge Chickamauga	2,472
Total	1,622

Making a total of 168 vessels with total gross registered tonnage of 911,958 tons actively in the membership Jan 1, 1920.

Of the 184 losses of which we have record for the sailing season of 1919, 34 have been adjusted, and of the balance, a considerable number have been surveyed and a few have not. The col-

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Accident Statement For Years 1909-1919

COMPARATIVE STATEMENT OF ACCIDENTS REPORTED DURING SAILING SEASON

	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
Strandings	54	9	14	31	20	18	30	18	23	22	16
Groundings	128	60	42	30	19	21	28	30	26	44	48
Collisions	125	88	66	50	52	15	26	31	39	33	40
Striking obstructions	25	17	8	12	10	2	2	1	8	..	9
Striking locks	5	1	2	2	1	..	..	..	3	..	4
Striking bridges, abutments, docks, breakwaters, buoy lights, canal walls, harbor and channel banks, cribs, etc.	48	40	38	38	30	22	28	35	40	49	42
Fire damage	3	1	4	..	..	1	1	..	2	1	1
Explosions	..	1	..	..	..	..	1	..	1	..	..
Stress of weather	9	2	..	2	4	..	1	2	4	4	4
Machinery damage	12	1	4	1	3	2	..	3	4	8	2
Rudder damage	..	4	5	1	1	..	..	..	1	..	..
Wheel damage	..	4	7	..	..	1	3	8	7	6	8
Bent and broken quadrants	..	1	2	1	..	..	..	..	..	..	..
Boiler damage	2	..	..	..	..	1	..	..	..	..	..
Collapsed decks	2	..	..	..	..	..	..	..	..	..	..
Cargo heating	1	..	..	..	..	..	..	..	..	..	..
Legal expenses	2	..	..	..	..	1	..	..	..	..	..
Lost anchor and chain	1	..	1	..	..	..	..	..	2	3	..
Ice damage	1	..	..	..	1	..	..	1	52	10	..
Salvage association fees	5	..	..	..	..	..	..	..	..	..	..
Unknown	1	..	..	..	..	..	..	..	..	..	..
Broken deck winches	..	..	1	..	..	..	..	..	..	..	..
Loading rig fell on deck	..	..	1	..	..	3	..	..	..	..	..
Cargo shifted	..	..	..	1	..	..	..	..	..	..	..
Ran over wreck Str. Joliet	..	..	..	1	..	..	..	..	..	..	..
Lost shoe and rudder	..	..	..	2	..	..	..	1	..	2	1
	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
Flooded; open sea cock	..	..	..	1	..	..	..	..	..	..	..
Dented plate	..	..	..	1	..	..	..	..	..	..	..
Twisted rudder stock	..	..	..	1	..	..	..	..	..	..	..
Gas explosion	..	..	..	1	..	..	..	..	..	..	..
Personal injuries	..	..	..	..	..	2	..	..	..	..	..
Mooring damage	..	..	..	..	..	3	..	..	..	1	4
Damaged lines	..	..	..	..	..	..	..	2	2	..	..
Settled on Bottom	..	..	..	..	..	..	..	..	..	..	1
Broken steering gear	..	..	..	..	..	..	..	..	1	..	..
Damaged spar	..	..	..	..	..	..	..	..	..	2	..
Unloading machinery damage	..	..	..	..	..	..	..	..	..	1	..
Struck unloading rig	..	..	..	..	..	..	..	..	..	3	1
Total losses	4	6	3	1	9	..	2	1	1	..	3
Total	428	235	198	177	150	92	122	133	216	189	184

Certificates written in 1909 on	370 vessels
Certificates written in 1910 on	402 vessels
Certificates written in 1911 on	295 vessels
Certificates written in 1912 on	329 vessels
Certificates written in 1913 on	211 vessels
Certificates written in 1914 on	179 vessels
Certificates written in 1915 on	168 vessels
Certificates written in 1916 on	175 vessels
Certificates written in 1917 on	186 vessels
Certificates written in 1918 on	174 vessels
Certificates written in 1919 on	171 vessels

lision case of the D. R. HANNA-QUINCY A. SHAW enters strongly into the result. It will not be known until the court decides liability whether we will be called upon to pay a further loss, under our collision liability clause on the QUINCY A. SHAW. Nor is it by any means certain that the wreck of the D. R. HANNA cannot be raised. After having a diver examine the ship R Parry-Jones is reasonably confident that she can be successfully salvaged. However, owing to the uncertainty of liability as between the two ships nothing can be done in the way of wrecking operations until this is definitely settled.

When the association was formed in the year 1909, we had 19 wooden steamers and six wooden barges in our membership, with a total of 47,600 gross tons. Some of these vessels have served their usefulness and have been abandoned. Others have been wrecked and lost at sea while still others have been sold into a less strenuous trade. In the loss of the CHICKAMAUGA the last wooden vessel in our membership disappeared.

From the best information available at present the association submits the following statement to indicate the possible result of this season's operation:

Contributions from all sources, covering the season of 1919 to close of the navigating season, together with interest from depositories, less lay-up and cancelling returns	$385,012.01
Expenses of the association, claims paid and claims estimated	451,309.51
Or, according to present computation there will be a loss in operation to the end of the navigating season of	66,297.50
If in the final adjustment of the D. R. Hanna-Quincy A. Shaw collision case, the Shaw is held either wholly or partially at fault there will be a further liability of	$ 95,025.00
Or, thereby indicating a possible total loss of	$161,322.50

The usual statement of the accidents by the months in which the loss occurred, and the percentage of the whole attributable to each month follows:

	1917		1918		1919	
	No. of Acc.	Per Cent of Whole Loss	No. of Acc.	Per Cent of Whole Loss	No. of Acc.	Per Cent of Whole Loss
April	7	1.32	6	.94	7	1.72
May	72	26.22	47	16.28	23	51.18
June	26	9.83	16	19.36	20	4.81
July	13	7.02	21	7.65	19	4.52
August	15	10.56	29	20.82	19	4.11
Sept.	15	6.36	19	15.72	37	12.68
October	28	17.21	22	7.02	29	11.03
Nov.	33	18.44	24	10.79	24	9.12
Dec.	7	3.04	5	1.42	6	.83
	216		189		184	

New Shipping Firms

During January, the aggregate capital invested in new shipping companies, according to figures compiled by the New York *Journal of Commerce*, amounted to $76,305,000. This is the highest figure for any month, with one exception, since the beginning of the war in 1914. The total for January was exceeded in June, 1917. The following list gives the new shipping and shipbuilding companies with an authorized capital of $50,000 or greater, organized in January, together with the state of incorporation and the authorized capital of each firm:

Atwater Shipping Co., Del.	$ 150,000
Buxtom Wilson, Inc., Del. (own and operate)	250,000
Bell Line, Inc., Del. (build and operate)	120,000
Buckeye Steamship Co., Del.	400,000
"City of Beaumont" Ship Corp., Del (build and operate)	200,000
"City of Pascagoula" Ship Corp., Del. build and operate)	200,000
"City of Galveston" Ship Corp., Del. (build and operate)	200,000
Chung Mai Trading Corp., Del. (build and operate)	.....
Diamond Steamboat & Wrecking Co., Del	150,000
European Steamship Line, Inc., Del.	150,000
Elder Steel Steamship Co., Del.	3,000,000
Glendoyle Steamship Corp., Del.	800,000
Glendola Steamship Corp., Del.	800,000
Glyndon Steamship Corp., Del.	800,000
General Steamship Corp., Del.	2,000,000
Grinan Steamship & Trading Corp., Del.	1,000,000
Honolulu Steamship Co., Del.	500,000
International Marine Mfg. Co., Del.	1,000,000
Jamaica Navigation Co., The, Del.	200,000
Matthew Addy Steamship & Commerce Corp., Del.	10,000,000
Manufacturers' Steamship Co., Del.	100,000
Norwegian America Line Agency, Inc., N. Y.	300,000
Norfolk Construction & Marine Repair Corp., Va.	1,000,000
Owens Towboats, Inc., Del.	1,000,000
Oriental Navigation Co., Del.	40,000,000
Polish American & Czecho-Slovak Steamship & Exchange Agency, Inc., N. Y.	100,000
Philadelphia Overseas Co., Del. (own and operate)	100,000
Saliger Ship Salvage Corp., The, Del.	5,000,000
Thames River Line, Inc., Del.	85,000
Tri-State Steamship Co., O.	100,000
Ukranian Navigation & Trading Corp., Del.	6,000,000
Western Shore Transportation & Exchange Corp., Del.	500,000
Total	$76,305,000

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Lake Commerce Shows Reaction

Due to Labor Disturbances, Lake Traffic Was Seriously Hampered—Under Adverse Conditions Huge Tonnage Was Moved—Vessel Operation Was Efficient

BY WILLIAM LIVINGSTONE
President, Lake Carriers' Association

AFTER three seasons of operations that were matchless in point of essential commodities moved and when every demand made upon the membership and tonnage of the Lake Carriers' association was promptly met and executed, it is natural that the lake commerce should experience a reaction, sustained alike by contemporaneous industries as an aftermath of war and economic and social disturbances that invariably follow great conflict, and to this extent the past season was disappointing.

Whereas the past 12 months' endeavor of the nation to return from a war basis to a peace basis has witnessed disaffection through radical influences and the country has been torn by labor strife, actual or threatened, this association conducted its lake traffic without labor disputes of any kind emanating from our own men. All difficulties of that nature were due to outside causes entirely beyond our control.

Through another of the overshadowing national events of the past year the association has won a moral victory. It has been vindicated in the unalterable position that was taken in April, 1908, when the open shop was proclaimed as fundamental. Though standing almost alone among the great industries in pronouncement of this position, events of the past year have caused the principle of the open shop to be sustained by public opinion. That the right to work must not be denied has been reaffirmed by the nation.

Almost all known elements antagonistic to favorable operations presented themselves to the membership of the association during the past year. There occurred the uncertainty in the steel market that lessened the demand for iron ore when ore should have been moving freely; the strikes of the ore and coal handlers occurring simultaneously with the strike of the railroad shopmen caused stagnation in the coal and ore movements during the period most favorable for successful operations; the strike of the longshoremen on the Atlantic coast that, choking the export elevators, reflected upon our fall grain movement; the strike of the steel workers, followed by the miners' strike which took all activity out of the last 60 days of the ore and coal trades. To none of these disturbances was the Lake Carriers' association a party but it suffered from them nevertheless.

Despite all encumbrances the lake fleet moved 90,000,000 net tons of freight during the navigating season of 1919. Iron ore totaled 47,177,395 gross tons. The movement of bituminous and anthracite coal totaled 25,000,000 net tons, the grain movement totaled 6,091,703 net tons, while the stone movement totaled 5,000,000 gross tons. These figures will compare favorably with the totals of any of the prewar seasons excepting 1913, when abnormal movements of coal and grain occurred and when there was an ore movement the best on record up to that time and in excess of the past year. Nevertheless, the past season's business was not representative of the country's requirements, nor commensurate with the intrinsic interests concerned.

The ability of the lake fleet to move 90,000,000 tons of freight under such constant adverse circumstances may in large measure be traced directly to the sagacious plan of co-ordination as laid down by the mobilization committee in 1918. Though the cause for continuing some of the subsidiary committees ceased to exist, the problem of rapid movement all along the line had been so well solved and tried out that the machinery continued to function. Beyond doubt the beneficial effects of the fleet having been mobilized will be felt in lake operations for some time to come.

In the membership of the association as of Jan. 1, 1920, there are 355 steamers and 27 barges, or a total of 382 ships representing gross tonnage of 1,982,830 tons. These figures record a loss of 16 vessels of a total of 40,755 gross tons as a result of sales, withdrawals from membership and destruction by the elements. Attention is called to the fact that with a single exception the losses sustained represented small ships.

Never during the season did the flow of ore from the upper lake ports to the unloading docks assume the dimensions of the ore traffic of any of the three preceding seasons. The total movement was 47,177,395 gross tons.

However diminished the shipment of iron ore from the mines may have been there will be no dearth in winter stocks on the docks. At the Lake Erie ports the docks held 10,454,843 gross tons as of Dec. 1, and this amount was materially increased by November shipments delivered in December and the slight movement of December. This represents the largest amount of ore ever on the Lake Erie docks at the close of navigation and as the winter requirements of the furnaces have never exceeded 5,000,000 gross tons the reserves are more than ample.

The grain movement during 1919 consisted of 223,377,838 bushels or 6,091,701 net tons, a loss of 21,925,116 bushels, or 456,979 tons from the movement of 1918. Shipments of wheat totaled 155,853,099 bushels against 167,717,891 bushels in 1918. The combined American shipments from Lakes Michigan and Superior consisted of 96,454,202 bushels while the Canadian shipments from Fort William and Port Arthur totaled 126,923,636 bushels.

The soft coal shipments totaled 22,800,000 net tons and in having made a 100 per cent movement of this com-

World's Greatest Lock

WHEN the fourth American lock at Sault Ste. Marie, Mich., was formally opened on Sept. 18, 1919, another epoch was written into the annals of the greatest of water traffic—the Great Lakes. With this, a twin of the Davis lock, yet possessing some additional features that make it stand out as the world's most superior lock, the efficiency of the system of locks at the Sault is now such as to remove the probability of any congestion of the fleet of bulk freighters occurring in the near future. Being 1350 feet long, two of the modern 600-foot bulk freighters may lock through together, end to end, and be lifted or lowered 20 feet with cargo, each totaling 13,000 gross tons, in eight minutes. The width of the lock chamber being 80 feet, and as the ideal breadth of the modern freighter is 60 feet, its width will suffice for all needs for many years to come.

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modity, the efficiency of the ore and coal exchange was once more made manifest. In other words, the season's demands were fulfilled despite handicaps as have not been experienced in the coal trade in many years.

An unusually brisk trade during the last three weeks of navigation served to swell the season's movement of anthracite coal to the point where it stands as the second largest since 1911 at least. Lake shipments consisted of 4,255,464 net tons from the port of Buffalo and 455,263 net tons from the port of Erie. These figures represent increased shipments of 667,500 tons and 94,522 tons, respectively, over the movements from those ports during 1918. The total movement of 4,710,727 tons of anthracite exceeds that of 1918 by 762,022 tons. Moreover, it exceeds the anthracite movement of every season during the past nine years with the exception of the record-breaking movement of 5,313,753 tons in 1913.

With figures available from three of the four possible sources from which the stone movement emanates, lake shipments of stone during 1919 totaled 5,720,790 gross tons.

There is urgent need to increase the efficiency of American labor from the estimated 60 per cent to as near 100 per cent as our industrial organism will permit. If we should attain 90 per cent we shall reap a rich reward for the whole world is seeking American raw material and merchandise. Industry is becoming more active and the country's buying power is on the increase, notwithstanding idleness caused by strikes.

When the season of 1919 opened the members of the Lake Carriers' association continued in force the same remunerative wage scale that was placed into effect during the fall season of 1918.

Encourages Seamen

Last July 21 the executive committee took up for consideration the selecting of men from the supply of ordinary seamen for services as deckwatch and suitable for training as seamen. It was decided that as an encouragement to men employed in the grade of ordinary seamen the minimum rate of wages for men holding United States government certificates as able seamen and employed as deckwatch on the vessels of the Lake Carriers' association be $85 per month and effective from date promulgated.

Before retiring from office William G. McAdoo, director of the railroad administration, made statement in his annual report commending the spirit of co-operation displayed by the lake carriers through the mobilization committee's ore and coal exchange in relieving the fuel shortage. He set forth that 479,058 cars of coal were dumped in 1917 into the vessels at the Lake Erie docks with an average delay of 2.3 days per car as a result of the first year's effort at co-operation under a single nongovernmental control, between the railroad, the coal producers and the lake carriers. In 1918, the second year, 542,380 cars of coal were dumped, with an average delay of 1.45 days.

The history of the welfare plan during the past year is one of constant progress. Along the well established lines for the comfort and well being of the lake seamen, educational advantages, thrift and healthful conditions aboard ship, the members of the welfare plan committee have given much thought and unstintingly of their time in the hope that the high standard may be raised to some extent every year.

Improves Assembly Rooms

As a primary purpose of the welfare plan to furnish immediate comforts and conveniences to the men through the medium of the assembly halls no efforts are spared to keep the assembly rooms in a fine state all of the time, making minor improvements and renovations whenever necessary. The assembly hall is the seaman's club and nothing is overlooked in the way of recreation such as games, facilities for correspondence; literature in the way of magazines and periodicals of direct interest to the sailor, as well as facilities for checking baggage.

Sanitary conditions, the care of food supplies and the safeguarding of the water supply received such careful attention years ago, that only enforcement of the established rules and precautions are necessary to insure their being kept up to the highest standard. How immune the ships were from contagious diseases during the past year is emphasized by the sick reports received from the vessels. There was not a single case of sickness traceable to unsanitary conditions aboard ship. There was a single case of diphtheria early in the season, and two or three cases of influenza in mild form. Not any cases of typhoid fever were reported from the ships in the membership of the association.

The free schools in marine engineering and navigation at Cleveland and Marine City, Mich., have become so well established, and contain such a variety of facilities for imparting the knowledge necessary for the seaman to obtain before going before the inspectors for examination, that the number of licenses per student shows an increase from year to year. Notwithstanding that only four years have passed by since the educational committee of the welfare plan launched the first schools from which the seamen entering as oilers, wheelsmen or boatswains, might emerge as licensed officers, no less than 154 of these originally licensed men held officers' positions on vessels in the membership of the association in 1919. Several of these have already been assigned to a first mate's berth. The progress made by the licensed officers who have attended the schools in order to obtain a raise of grade has been equally rapid.

Now that the second year's experiences have been completed, it can be said that in the plan of having ship safety committees aboard the steamers in the membership of this association, a responsive chord has been struck in the method of safeguarding the men aboard ship from personal injuries.

There were safety committees giving active study to the question of eliminating accident on 258 steamers of the association. With six men to a committee this meant a total of 1548 seamen who had assumed the responsibility of constantly advocating safety first principles aboard ship and of warning the others in the crew against danger and dangerous, as well as careless, practices.

To facilitate the operation of vessels and as a safeguard in the rivers and channels, the Lake Carriers' association maintained private aids to navigation as during the more pressing war period. The various aids were of particular value during the past season as unusually heavy fogs prevailed and in the late spring and early summer heavy smoke from forest fires was an impediment to traffic all the way from Sault Ste. Marie to Lake Erie. A government vessel, with representatives of the Lake Carriers' association aboard, operated in the vicinity of Brush point, directing the vessels to the particular lock to be used, furnishing information concerning depths of water and such other matters of which it was necessary for masters to be in possession. The water signal station showing the stage of water over Vidal shoals was maintained as in previous years.

Closing Days Were Active

The early retirement of so many of the large bulk freighters as a result of the fitful demand for vessel tonnage lent to the closing days of navigation what resembled marked activity. The small number of vessels remaining in commission were kept busy disposing of the last loads of coal, grain and ore but the windup would have been commonplace had the entire fleet continued to operate.

In marked contrast with the summer-like weather of one year ago weather conditions throughout the last 21 days were of almost unprecedented severity. Peculiarly this applied almost exclusively

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to the Lake Superior region for whereas the upper lake ports were experiencing temperatures well below zero with thick ice in the harbors, autumnal weather prevailed at the Lake Erie ports until Dec. 9. On Dec. 11 the last vessel to clear from Buffalo had plain sailing until she reached the Detroit river and with the season thus terminated, so far as sailings were concerned, Lake Erie furnished the record of having had her harbors constantly open since April 3, 1918, making an uninterrupted period of 20 months possible for navigation.

Tie Up Vessels

Following the disastrous Lake Superior storm of Nov. 10-14, a mild period enabled many of the waiting vessels at Duluth and Superior to obtain their ore cargoes, but on Nov. 26, Duluth reported a temperature 10 degrees below zero and from that time on navigation at the head of the lakes was conducted under precarious conditions. Although the Missabe dock was closed down that day, an ore movement continued from other ports. As the cold increased in intensity from day to day sailing orders of some steamers were cancelled, others cleared partly loaded, while still others were tied up at the docks for the winter with part cargoes aboard.

Late in the afternoon of Nov. 29, a drop in the barometer to below 28.00 gave short warning of an impending "whole gale" on the four lakes. Fortunately the association and other agencies anticipated the fury of the short but violent blow by communicating with shipping, thus averting any possible serious consequences. At midnight that night, Duluth reported a temperature 24 below zero and at Escanaba, where five steamers were waiting to load ore, it was 5 below. Ice made so fast that Duluth reported a thickness of six inches in the bay with from 18 to 24 inches of ice in the slips of the harbor. It is doubtful if ever in the history of the Dec. 1-to-12 vessel operations that the head of the lakes passed through such prolonged periods of extreme cold. On Dec. 2 it was 20 below zero; on Dec. 8, 14; on Dec. 9, 22; and Dec. 14 it was 24 below zero. At the beginning of the cold spell tugs were required to break the ice for steamers incoming with coal. Work on all the ore docks was suspended with the exception of the Great Northern dock at Superior, from which the steamer THOMAS BARLUM cleared with the last load of ore on Dec. 3, and at Escanaba, from which port the steamers B. F. BERRY and LOUIS W. HILL sailed with the last loads on Dec. 4. In the meantime a good sized fleet downbound encountered difficult navigation at different points below the locks and in consequence a large quantity of ore loaded in November was thrown steamers, loaded with ore or grain, were into December delivery. On Dec. 3, 15 fast in the ice at the head of Mud lake, requiring the assistance of tugs to break a channel.

The steamer B. F. BERRY arrived at Buffalo on Dec. 8 with the last ore cargo and departed for Milwaukee on Dec. 11 with the year's last cargo of hard coal. The first low temperature in the Lake Erie region having developed during her trip across that lake the BERRY experienced long delays after reaching the Detroit river and her progress was more seriously impeded as thicker ice was found further north. She did not reach the Straits of Mackinac until noon Dec. 16, when she went aground and was not released until the 19th.

The soft coal movement continued until Dec. 10 when the steamer JOHN J. BARLUM cleared from Toledo with a cargo consigned to Manitowoc. The advantage of 24 hours' start over the BERRY permitted her to pass into Lake Michigan before an adverse wind had filled the straits with ice and she docked at Manitowoc on Dec. 16.

The Canadian grain commission having come into the market for American tonnage to move a large amount of late grain, perhaps 15,000,000 bushels, such steamers in the membership of the association as were open for charter aided the Canadian fleet of 25 steel steamers in filling the order. There was, consequently, a continuance of the very active trade that had been in progress from Fort William and Port Arthur during all of the late fall. The final cargoes taken out of the ports at the Canadian head of the lakes were brought down under the extremest of navigating conditions. With the expiration of extra insurance at midnight Dec. 12, and with a storm in progress, these vessels sailed from Fort William. The fleet consisting of the H. K. OATES and CHARLES O. JENKINS and the Canadian ships MARTIAN, J. H. G. HAGARTY, and MIDLAND KING ran for the Welcome islands to join the STADACONA and E. B. OSLER in shelter there. Although remaining under shelter only until daylight the fleet, increased to seven, did not reach the Sault until the 14th.

Ice Hinders Navigation

Ice became a menace to navigation in the Detroit river on Dec. 12, when the LAKETON became fast in the vicinity of Bar point. Later she went aground due to low water an in addition to the assistance of tugs and the wrecker FAVORITE it was necessary to lighter part of her grain cargo. The LAKETON was released on Dec. 17 and after reloading started on her way down. She was caught in the ice off Colchester on Dec. 19 but with the assistance of the tug accompanying her was released the next morning and proceeded on her way to Port Colborne and thus the navigating season at the lower end of the lake came to an end.

Vessel Losses During 1919

DURING the 1919 season of navigation on the Great Lakes 18 vessels of all types became total losses. It can be stated for the third consecutive year that not a single life was lost through shipwreck of a steel bulk freighter. The losses of life which occurred were through the wrecking in storms of four wooden ships, one passenger steamer and one composite bulk freighter.

As it was a season characterized by fogs, heavy smoke and unusually severe gales on all the lakes excepting Lake Erie, it is remarkable that 11 of the disasters were kept entirely free from casualty. The loss of the steamer JOHN OWEN, with all of her crew, is the first serious loss sustained by the Lake Carriers' association since 1916.

Regrettable as are the sacrifices in human lives, it may be said that all were caused by storms of great severity and could not have been arrested by human agency. The vessels lost were caught before warnings could be flashed to them. With what care the vessels of the Great Lakes are navigated and to what extent all agencies, from government officials to vessel managers, members of the association and port officials, went to safeguard ships from the whole gale which burst with little warning on the evening of Nov. 29 is well exemplified by the fact that not a single disaster occurred, although it was the worst storm of the season.

It is well to point out that the past season's ship losses were not beyond the average; neither was the tonnage loss much greater. In 1917 there were 20 ships lost, representing a total of 24,086 gross tons; in 1918 21 ships of 21,035 gross tons. The past season's losses, totaling 18, represents a gross tonnage loss of 26,485. Vessel losses affecting the ore, coal and grain trade numbered five.

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Bits From the Log of Progress

Events of Interest to Those Engaged in Operating, Constructing and Outfitting Yards and Ships

A RECORD in the transportation of household goods recently was made by the Westinghouse Electric & Mfg. Co. Seventy-five engineers and their families were moved from East Pittsburgh to Lester, Pa. The new location is within 10 minutes' walk of the company's South Philadelphia works. Photographs were taken of the houses and these, together with blueprints, were given to the engineers. Each man selected the house he wanted and designated on the blue print where he wanted his furniture placed. The company did the rest—crated, pack and moved the furniture and located it again in the new houses. The entire job was handled in eight days.

* * *

NEW ORLEANS inceased its foreign trade during 1919 nearly 50 per cent. Total for the year was $700,000,000. For 1918 the total was $524,255,286. Fifteen new steamship lines were organized to operate out of New Orleans in 1919 which brings the total of lines running out of that port to 52. In 1914, there were but 26. For the fiscal year ended Aug. 1, 1919, vessel clearances from New Orleans numbered 2163. River traffic also was increased materially.

* * *

JOHN BARLEYCORN is to be given a new lease of life, in one way, if some congressmen have their way. Due to the fact that liquor is freely sold on vessels of foreign registry, the opinion is held that this country cannot operate "dry" passenger ships in competition with those of nations who hold more liberal views. A bill is now in congress (H. R. 11579) which sets forth that nothing in the national prohibition act shall prevent the carrying of liquors on passenger vessels of either American or foreign registry provided that within the 3-mile limit of the shores of the United States no liquor shall be sold and all containers locked up and sealed.

* * *

WITH THE departure of the Cunard liner IMPERATOR from Southampton and Cherbourg on Feb. 21 for New York, the line will inaugurate the experiment of having a ship's bank to change money for passengers and to transact general financial business. The chief reason for trying the experiment at this time while passport regulations are in force and travel restricted to a certain extent is because of the low rate of exchange between the United States and Great Britain and France and the constant fluctuations in value of the dollar.

* * *

THROUGH AN arrangement made by the navy department with the state department, United States consuls at various ports throughout the world will send by wireless or cable daily a report on various matters relating to ships and shipping. The government agents will pay particular attention to entrance and clearance of American ships in foreign ports. Information received will be forwarded to New York and published in a daily bulletin which is issued by the United States naval communication service.

* * *

THE BUREAU of navigation reports that during the calendar year of 1919, private American enterprise built 2338 merchant vessels of 4,213,891 gross tons which have been officially numbered for American shipowners. American shipbuilders also built 25 vessels of 44,250 gross tons for foreign owners making a total output of 2363 vessels of 4,258,-141 gross tons in a period of 12 months.

* * *

PRACTICE OF masters of foreign vessels in demanding a commission on supplies purchased for their ships from American merchants was strongly denounced recently before the merchant marine committee during a hearing on the bill, H. R. 9572, to prohibit the payment of gratuities to the masters of vessels, or other persons, for the purpose of inducing or securing contracts for repairing vessels or furnishing vessels with supplies and other necessities.

* * *

THIS MONTH the Cunard line expects to begin construction of a $30,000,-000 freight terminal on the Weehawken waterfront of the Hudson river, according to an announcement of Sir Ashley Sparks, director general of the line in the United States and Canada. Eight 1000-foot steel and concrete piers, double decked, will be erected. These will be equipped with modern mechanical loading of freight. Plans for the enterfeatures for the rapid loading and unprise were prepared by John R. Todd and Olaf Hoff.

* * *

CHAIRMAN PAYNE, of the shipping board, in a recent letter to Chairman Goode, of the house appropriations committee, withdrew the shipping board's request for an additional appropriation of $125,000,000 for the current fiscal year. He pointed out that the board will in all probability be self-supporting. The letter followed the "discovery" that the shipping board has cleared between $100,000,000 and $125,000,000 since Jan. 1, 1919, at which time ships were put on a peace basis.

* * *

Recent estimates state that it will cost the United States $50,000 to make alterations in the EASTERN BREEZE, the first steel steamer to be turned over by the Japanese shipyards to the United States government. The bunks were designed for Japanese sailors and are but 5 feet long. Wood was used for the construction of bathtubs instead of metal.

* * *

NEGOTIATIONS which stretched over several months have ended in a contract being signed by the United States shipping board and the Smith-Eisemann Corp. of America, New York, under which the latter purchases 8000 tons of shipbuilding material comprising plates and bars. About 5000 tons are located at the storage points of the Emergency Fleet corporation at Leetsdale and Pottstown, Pa., and about 3000 tons at the plants of the American Bridge Co., at Toledo, O., Elmira, N. Y., Gary, Ind., and Walkerville, Ont. Most of the plates, many of which are between 25 and 40 feet long, have been resold to French interests to be used for rebuilding certain units in the French merchant marine and have been shipped to France. The portion of the tonnage not being shipped to France will be maintained in stock by the Smith-Eisemann Corp. The latter has purchased from the shipping board winches, windlasses and pumps and other ship material for shipment to France.

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Bits From the Log of Progress

Events of Interest to Those Engaged in Operating, Constructing and Outfitting Yards and Ships

THE third electrically-driven superdreadnaught to be launched for the United States navy, the CALIFORNIA, took the water at Mare Island, Cal., recently. The United States navy is the only one in the world to equip battleships with electric propulsion. Propelling machinery for this vessel was designed by W. L. R. Emmet, consulting engineer for the General Electric Co., Schenectady, N. Y. The CALIFORNIA'S turbines are capable of developing 28,000 horsepower. She has four motors connected to her four propeller shafts. Each motor is 12 feet in diameter and weighs 62 tons. Steam is generated in nine boilers working in a pressure of 250 pounds to the square inch. Part of the steam is diverted to the six auxiliary turbo-generator sets in different parts of the vessel. These produce current for various purposes. The CALIFORNIA is fitted to burn oil instead of coal. She takes on bunker through a 6-inch hose. Her oil capacity is 1900 tons. The CALIFORNIA is estimated to have 30 per cent better protection than any other American battleship. She carries twelve 14-inch guns, four submerged torpedo tubes, twenty-five 2-inch rapid-fire guns, four 6-pounders, two 1-pounders, four 3-inch antiaircraft guns, one 3-inch landing gun and two 30-caliber machine guns. Her big guns have a range of 18 miles fire being directed from the masts.

* * *

APPROXIMATELY 100 men are now steadily employed on repair work at the Anderson plant, Lake Washington, Seattle. This plant was leased recently for a term of five years by the J. H. Price Construction Co. Among the work on hand is the rebuilding of the King county ferryboat LESCHI. Six other vessels are also at the plant for overhauling and repairing. Two wooden motorships are also in the process of construction.

* * *

ORDERS HAVE been issued by President Evans of the Baltimore Dry Docks & Ship Building Co., Baltimore, to the effect that foremen must resign from labor unions or seek employment elsewhere. This action grew out of the strike of approximately 1000 electrical workers to enforce the reinstatement of a foreman who had been discharged for refusing to employ an electrician's helper because he did not carry a union card. The strike was ordered by the business agent of the electricians' union upon the company's refusal to reinstate the foreman.

* * *

THE MOORE Shipbuilding Co., Oakland, Cal., is said to hold the record for the number of vessels delivered to the United States shipping board from the Southern Pacific district during 1919. Within the year, the company delivered 13 vessels with a total of 122,800 deadweight tons, second place being held by the Bethlehem Shipbuilding Corp. with 10 vessels totaling 112,000 tons. The shipping board officially lists the yards of the Southern Pacific district as follows: Moore Shipbuilding Co., 13 vessels, 122,800 deadweight tons; Bethlehem Shipbuilding Corp., 10 vessels, 112,000 tons; Los Angeles Shipbuilding & Drydock Co., 10 vessels, 88,000 tons; Southwestern Shipbuilding Co., 10 vessels, 88,000 tons; Western Pipe & Steel Co. (Schaw-Batcher shipyard), eight vessels, 70,400 tons; Long Beach Shipbuilding Co., six vessels, 44,400 tons; Pacific Coast Shipbuilding Co., three vessels, 28,200 tons; Union Construction Co., two vessels, 18,800 tons; Hanlon Drydock & Shipbuilding Co., two vessels, 10,000 tons.

* * *

RECONVERSION OF the U. S. S. HURON from a big troop transport at the Morse Dry Dock & Repair Co., Brooklyn, N. Y., to an American passenger liner and mercantile vessel embodies all the newer features providing for the comfort of travel. The ship is being made nonrolling and oilburning and will contain among other things a printing shop, gymnasiums, sun parlors, children's play rooms, etc. Conversion of this vessel represents a heavy financial outlay.

* * *

THE HOUSING department of the Emergency Fleet corporation will dispose of the shipyard village at Yorkship where the government spent more than $10,000,000 in developing and building 1500 homes for the workers of the New York shipyard in South Camden, N. J. The New York Shipbuilding Corp., which is the owner of the shipyard in the lower end of Camden and Gloucester, has been asked by the Emergency Fleet corporation to buy the village and negotiations to this end are said to be under way.

* * *

THE NAVY transports YALE and CHARLES (formerly the HARVARD) now lie at the Philadelphia navy yard to be sold. Sealed proposals will be received up to noon, Feb. 21. These are famous vessels in many ways. Years ago they were crack express liners between New York and Boston. Both vessels are turbine driven and are among the first ships to be successfully equipped with this type of drive. After running on the New York and Boston route for a number of years they were sold to Pacific coast interests, being engaged in Pacific coastwise traffic. The war resulted in their being converted into transports and now it seems that they stand an excellent chance of having a new lease of life.

* * *

THE WAYS of the New York Shipbuilding Co., Camden, N. J., are full at the present time and the advent of spring will see many launchings. At present 10 United States torpedo boat destroyers are on the ways and they will be completed as far as possible before they take the water. There are also two battleships and a cruiser besides 12 merchant vessels. Keels of some of these ships were laid recently. The yard launched 18 destroyers in 1919 besides 25 merchant ships.

* * *

CAMDEN AND Gloucester, N. J., shipyards report the past year as entirely successful. These yards are preparing to build a number of ships for private account during the present year. Men to the number of 22,000 are employed in these yards. This is about half the number that will be employed during the present year as soon as operations are well under way.

* * *

PUSEY & JONES, Gloucester, N. J., have four ships on the ways at the present time. The yard has begun work on three tankers of 8500 tons each for a French firm and has contracts for 14 colliers, it is announced.

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Hurt by Government Competition

Operators of River Packets on the Mississippi Feel that Unequal Struggle Will Force Them Out of Business

BY FRED B. JACOBS

BEFORE the Civil war, St. Louis was one of the busiest inland ports in the world. In those days it was a common sight to see 100 or more steamboats tied up at the levee loading and unloading, while the waters of the river were constantly churned by the paddle wheels of a never-ending procession of vessels. Then river commerce was at its height. Today the scene is different. Grass growing in the crevices on the immense stone-faced levee at St. Louis bears mute evidence of little activity while one might stand on the Eads bridge for hours at a time without sighting a single craft under way. The few steamers tied up at the wharfboats are a pitiful reminder of the swift packets of other days, such craft as the ROBERT E. LEE, A. L. SHOTWELL, J. M. WHITE, ECLIPSE and NATCHEZ.

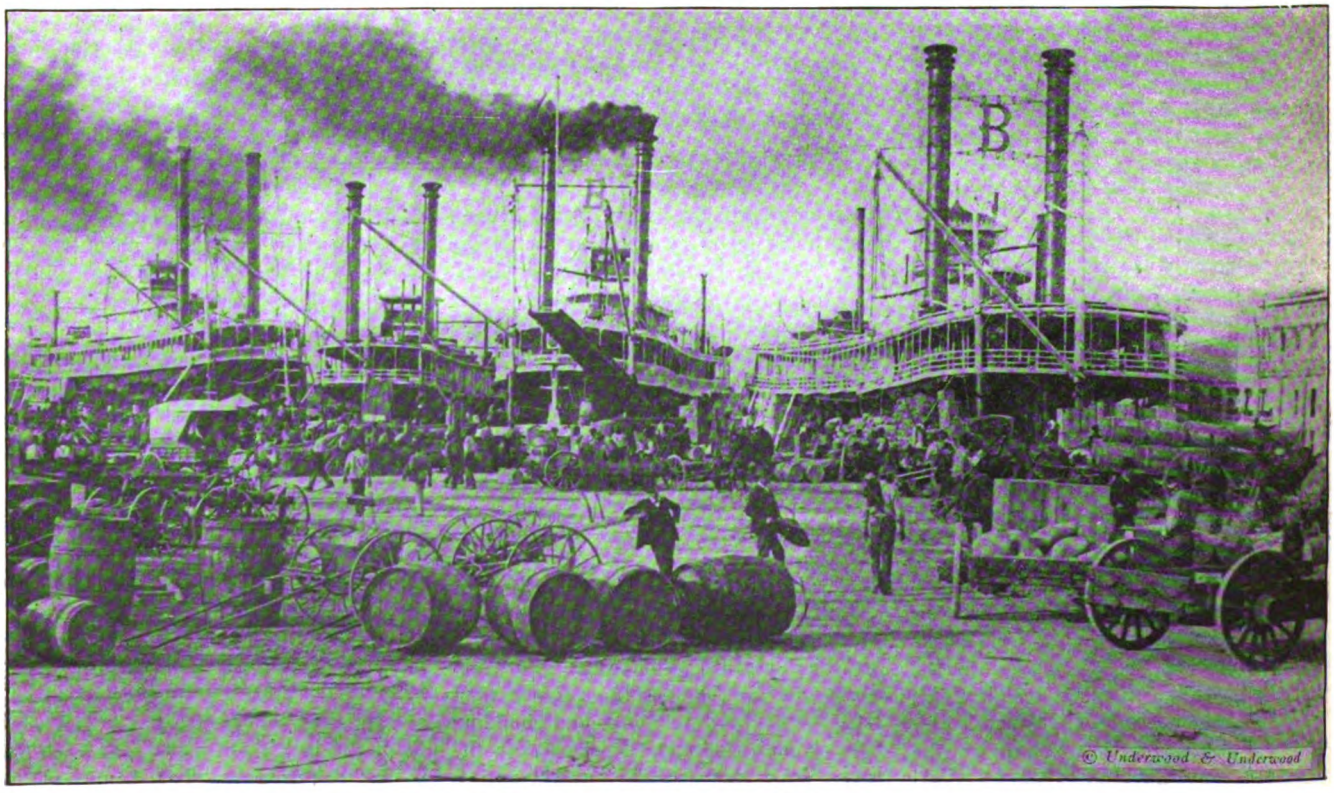
As stated in an article in THE MARINE REVIEW of October, 1919, the government has taken steps to rehabilitate Mississippi trade but the fact that government owned vessels are to plow the Father of Waters is not looked upon with favor among Mississippi river packet line operators who are now fighting for existence. The government for many years has been improving the Mississippi. It has marked shoals, removed numberless snags and spent millions in dredging work, but commerce on the river has lagged until today private operators stand a better chance of going out of business than they do of paying dividends.

J. E. Massengale, traffic manager for the St. Louis & Tennessee River Packet Co., recently gave the writer some reasons for this condition. This line operates a number of river boats and as Mr. Massengale has been in the business long enough to remember when Mark Twain was a river pilot's cub, his knowledge of river boat operating conditions can hardly be disputed.

"The Anchor line, I was connected with it before the Civil war, was the greatest line that ever operated on the Mississippi," said Mr. Massengale, "but the railroads ran it out of business 25 years ago. And now that the government is inaugurating a line of towboats on the river, I presume the rest of us will eventually go under. In the old days we could take a load of wheat from St. Louis to New Orleans, load it and unload it, for 10 cents a bushel. And there was money in it.

A Veteran's Views

THE accompanying article is the result of a direct interview with J. E. Massengale, traffic manager of the St. Louis & Tennessee River Packet Co., St. Louis. He was asked about the feeling on the part of Mississippi river packet operators toward the government's plan for operating steel barges and towboats on the Mississippi. As Mr. Massengale has been in the river packet business all his life, he is in a position to speak authoritatively. He was connected with the Anchor line before the Civil war and was acquainted with Mark Twain when he was a cub pilot under Horace Bixby. He knows the river and, furthermore, is not at all reticent in expressing his views against what rivermen term an unjust discrimination.



SCENE ON THE MISSISSIPPI—THESE VESSELS ARE TYPICAL FREIGHT AND PASSENGER PACKETS

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I can remember," he continued, as he warmed up to the subject, "when steamboats made an actual profit of $6000 on one 30-day trip. Labor in those days was, of course, cheap although pilots were paid high salaries. The boats were large, too. One of the biggest river boats was the JAMES HOWARD. The average packet was of approximately 2000 tons.

"We could make a fair profit today if the government would give us a show but we are discriminated against on every hand. Take the subject of freight rates, so vital to the steamboat operator. The railroads, under government control, from St. Louis to Memphis, Tenn., quote a freight rate of 20 cents a barrel on flour. From St. Louis to any point in Kansas, they get 55 cents. Why this difference? To discriminate against the steamboat operators. From Kansas City, Mo., to New Orleans the rate on corn is 15 cents a hundredweight. From Kansas City to points in Montana the rate is 60 cents a hundred. It is this discrimination that is gradually forcing us out of business. We do not ask favors of the government. Let the railroads quote equal rates for all points and then if we cannot remain in business we are willing to quit. With fair competition it would be a case of the survival of the fittest and if we cannot remain in business under such conditions we are willing to quit.

Government Pays High Salaries

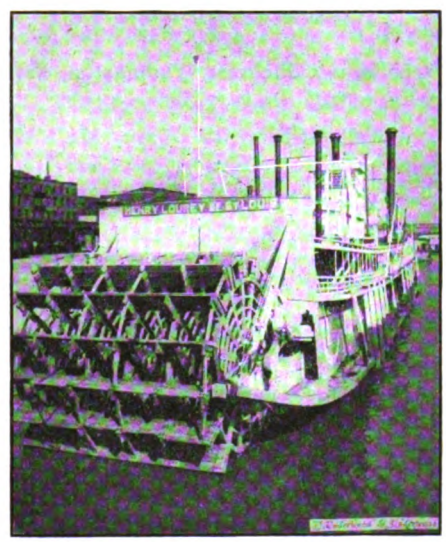
"But the question of freight rates is not the only one wherein we have been discriminated against. Take the question of labor. Before the world war, we could get pilots for $150 a month. The government picks out the best ones and hires them away from us by offering $200 a month. How can we meet severe railroad competition and pay high wages at the same time? It can't be done.

"Our operating costs have been increased in other ways, also. I will give you a typical illustration. Not long ago one of our boats was just about to sail when it was found that an exhaust pipe on a mud drum needed replacing. I called up a shop that has been doing our repair work for a number of years. They sent down four men who worked from 4:30 until 9 p. m., and replaced a piece of pipe 8 inches long. The bill was $85.52 for labor and $2 for material. Can you survive under such conditions? We are compelled to pay dearly for repairs these days.

"In my opinion, this new fleet of government-owned boats is just another means of throwing away the people's money. Of course they can operate, backed by the government, but it certainly seems unfair to discriminate against the privately-owned line in the matter of freight rates and then to cap the climax, operate in competition with us on the river."

Such are the conditions as they exist today as told by Mr. Massengale. However, river boat operators see a ray of hope in the fact that the new steel barges and towboats may not prove as efficient as the standard type of wooden side and stern-wheel vessels that have been used on the Mississippi and its tributaries for generations.

Men who know the river and river commerce conditions point out that the present-day type of wooden steamer is a gradual development by which a type of craft has been standardized that best meets the conditions under which it has to operate. Owing to the low stage of the river at certain times of the year



TYPICAL STERN WHEEL RIVER PACKET

the vessels must be of shallow draft. It is an actual fact that these vessels must be limber, like a raft, to permit them to be helped over sandbars without serious straining to the hull. Again the propelling machinery, while it may look crude and inefficient to one whose experience has been gained on the Great Lakes or the ocean, is highly efficient for the purpose for which it is designed. These engines must be elastic to a remarkable degree to permit them to run properly, even when out of alignment, caused by the twisting of the vessel's hull. Again, frequent landings and crooked rivers demand that the engines be stopped, started and reversed frequently. In fact the wheels must be started from almost any position.

These conditions are successfully met with the long-stroke, small-bore, high-pressure, noncondensing horizontal engines of slow speed, located directly on the vessel's after deck. The valve gears of these engines are operated by cams so arranged that the cylinders can be given steam for the full piston stroke or cut off at part stroke. Other types of engines have been tried on the Mississippi, but it is a noticeable fact that they have all been abandoned after having proved costly experiments. The *International Library of Technology* has the following to say regarding the type of engines used on Mississippi river steamboats:

"The western river engine, as it is built today, is a case of the survival of the fittest; and having stood the test of time—it is built today practically as it was 40 years ago—it is not likely that it will be superseded."

On the other hand, the barges and towboats building at the present for use on the Mississippi are the products of able engineering brains. In reality, they are adapted from types of vessels used on shallow rivers in Europe and South America. Whether they will meet competition on the Mississippi after the government relinquishes control of them, as it will undoubtedly do after the railroads are returned to private ownership, is a question that cannot be answered at the present writing. It remains for actual operation of several years to prove their true worth.

Builds Ships in Dock

On Dec. 16, the navy ammunition ships PYRO and NITRO, each of 10,000 tons displacement, were launched at the Puget sound navy yard, placing that government plant among those actively engaged in construction. On the same day the great shipbuilding drydock was dedicated and the big navy ships were launched when the valve was opened flooding the dock and floating the hulls. This honor fell to Mrs. Gregory, wife of Capt. Luther Gregory, United States navy, who designed and built the dock, the only one of its kind, outside of Germany, which has two such shipbuilding basins. The keel of one of the vessels launched was laid before the dock was completed, it having been made possible by the construction of a cofferdam around the ship's cradle. This work has aroused considerable interest. Since the floating of the PYRO and NITRO, authorization has come from the navy department for the construction of a 482-foot submarine mother ship and a repair vessel, each of 10,600 tons displacement. The repair ship will be known as MEDUSA and the submarine tender as No. 3. This work will involve an expenditure of about $6,250,000.

According to present indications all the wooden steamers built in the Oregon district for the government will be in commission by March 1.

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1919 Construction Record of U. S. Yards

Wooden Ships Only

(Steel Ships Listed in February Issue)

North Atlantic District

Cumberland Shipbuilding Co., So. Portland, Me.

Hull No.	Name	Dead-weight tonnage	Contract or requisitioned	Type	Date launched actual or estimated	Date delivered actual or estimated	Speed, knots	H. P., shaft or indicated	Fuel	Length between perpendiculars, feet, inches	Beam molded, feet, inches	Depth molded, feet, inches	Draft ft. in.
382	Cumberland	3,500	Cont.	Ferris	6-29-18	12-27-18	10.00	1400 I	....	268-0	x 45-2	x 26-0	23-10½
383	Falmouth	3,500	Cont.	Ferris	8- 7-18	9-16-19	10.00	1400 I	....	268-0	x 45-2	x 26-0	23-10½
384	Belgrade	3,500	Cont.	Ferris	10-11-18	6-21-19	10.00	1400 I	....	268-0	x 45-2	x 26-0	23-10½
385	Lewiston	3,500	Cont.	Ferris	10-31-18	8-18-19	10.00	1400 I	....	268-0	x 45-2	x 26-0	23-10½
386	Orhom	3,500	Cont.	Ferris	4- 2-19	9- 5-19	10.00	1400 I	....	268-0	x 45-2	x 26-0	....
387	Wacolum	3,500	Cont.	Ferris	5- 3-19	7- 3-19	10.00	1400 I	....	268-0	x 45-2	x 26-0	....
388	Delmarie	3,500	Cont.	Ferris	7- 2-19	9- 5-19	10.00	1400 I	....	268-0	x 45-2	x 26-0	....

Freeport Shipbuilding Co., So. Freeport, Me.

436	Nemassa	3,500	Cont.	Ferris	11-19-18	8-20-19	10.00	1400 I	....	268-0	x 45.2	x 26-0	....
461	Harraseeket	3,500	Cont.	Ferris	5-29-19	9- 5-19	10.00	1400 I	....	268-0	x 45.2	x 26-0	....

George A. Gilchrest, Thomaston, Me.

346	Utoka	3,500	Cont.	Ferris	12-17-18	9-18-19	10.00	1400 I	....	268-0	x 45-2	x 26-0	23-10½

Kelley-Spear Co., Bath, Me.

441	Columbine	3,500	Cont.	Ferris	7-30-18	6-16-19	10.00	1400 I	....	268-0	x 45-2	x 26-0	23-10½
2335	New Meadows	2,500	Cont.	Barge	9- 9-19	9-18-19	.....	.....	....	229-5	x 37-0	x 20-6	....
2336	Winnegance	2,500	Cont.	Barge	7-31-19	8- 8-19	.....	.....	....	229-5	x 37-0	x 20-6	....

Russell Shipbuilding Co., East Deering, Me.

156	Allison	3,500	Cont.	Ferris	11- 5-18	6-19-19	.....	1400 I	....	268-0	x 45-2	x 26-0	23-10½
1037	Brevard	3,500	Cont.	Ferris	1-15-19	9- 5-19	.....	.....	....	268-0	x 45-2	x 26-0	23-10½
1038	Briarcliff	3,500	Cont.	Ferris	3- 6-19	9- 5-19	.....	.....	....	268-0	x 45-2	x 26-0	23-10½

Sandy Point Shipbuilding Co., Sandy Point, Me.

486	Waukomis	3,500	Cont.	Ferris	4-12-19	9- 5-19	.....	.....	....	268-0	x 45-2	x 26-0	....
487	Albrook	3,500	Cont.	Ferris	6- 3-19	9- 5-19	.....	.....	....	268-0	x 45-2	x 26-0	....
2476	Sandy Point	2,500	Cont.	Barge	8-29-19	10-14-19	.....	.....	....	229-5	x 37-0	x 20-6	....
2477	Searsport	2,500	Cont.	Barge	9-26-19	10-30-19	.....	.....	....	229-5	x 37-0	x 20-6	....

Machias Ship Construction Co., Machias, Me.

2323	Wellesley	2,500	Cont.	Barge	4- 3-19	5-31-19	.....	.....	....	229-5	x 37-0	x 20-6	....
2324	Jonesport	2,500	Cont.	Barge	5- 3-19	8-26-19	.....	.....	....	229-5	x 37-0	x 20-6	....
2325	Cutler	2,500	Cont.	Barge	5-31-19	9-18-19	.....	.....	....	229-5	x 37-0	x 20-6	....

L. H. Shattuck, Inc., Newington, N. H.

391	Roy H. Beattie	3,500	Cont.	Ferris	7- 4-18	4- 1-19	.....	1400 I	....	268-0	x 45-2	x 26-0	....
393	Wasagya	3,500	Cont.	Ferris	5-29-19	9-20-19	.....	.....	....	268-0	x 45-2	x 26-0	....
394	Milton	3,500	Cont.	Ferris	7- 4-18	6- 7-19	.....	1400 I	....	268-0	x 45-2	x 26-0	....
395	Haverhill	3,500	Cont.	Ferris	8-24-18	8-13-19	.....	1400 I	....	268-0	x 45-2	x 26-0	....
396	Silvanus	3,500	Cont.	Ferris	4-14-19	8-18-19	.....	.....	....	268-0	x 45-2	x 26-0	....
397	Ammanoosuc	3,500	Cont.	Ferris	9-21-18	8-23-19	.....	1400 I	....	268-0	x 45-2	x 26-0	....
398	Yawah	3,500	Cont.	Ferris	11- 7-18	9- 8-19	.....	1400 I	....	268-0	x 45-2	x 26-0	....
399	Winaple	3,500	Cont.	Ferris	5- 3-19	9- 5-19	.....	.....	....	268-0	x 45-2	x 26-0	....
400	Woyaca	3,500	Cont.	Ferris	12- 7-18	9- 3-19	.....	1400 I	....	268-0	x 45-2	x 26-0	....
401	Newton	3,500	Cont.	Ferris	1- 4-19	11-13-19	.....	1400 I	....	268-0	x 45-2	x 26-0	....
402	Yustan	3,500	Cont.	Ferris	6- 2-19	9- 5-19	.....	.....	....	268-0	x 45-2	x 26-0	....
403	Ulak	3,500	Cont.	Ferris	6-28-19	9- 5-19	.....	.....	....	268-0	x 45-2	x 26-0	....
404	Dover	3,500	Cont.	Ferris	7-24-19	9- 5-19	.....	.....	....	268-0	x 45-2	x 26-0	....
405	Newburyport	3,500	Cont.	Ferris	8-15-19	9- 5-19	.....	.....	....	268-0	x 45-2	x 26-0	....

Francis Cobb Shipbuilding Co., Rockland, Me.

2481	Whitehead	2,500	Cont.	Barge	10-11-19	10-27-19	.....	.....	....	229-5	x 37-0	x 20-6	....

Crosby Navigation Co., Richmond, Me.

2577	Hallowell	2,500	Cont.	Barge	10-18-19	10-31-19	.....	.....	....	229-5	x 37-0	x 20-6	....
2578	Richmond	2,500	Cont.	Barge	9-11-19	10- 4-19	.....	.....	....	229-5	x 37-0	x 20-6	....

Richard T. Green Shipbuilding Co.

2290	Nahant	2,500	Cont.	Barge	4-17-19	7-31-19	.....	.....	....	229-5	x 37-0	x 20-6	....

Crowninshield Shipbuilding Co., Fall River, Mass.

1229	Fame	.....	Cont.	O. Tug	8-17-18	2- 7-19	.....	850 I	....	143-0	x 29-5	x 17-6	....
1230	Tartar	.....	Cont.	O. Tug	10- 2-18	4-30-19	.....	....	....	143-0	x 29-5	x 17-6	....
1231	Astrea	.....	Cont.	O. Tug	10-14-18	6- 7-19	.....	....	....	143-0	x 29-5	x 17-6	....
1232	Cleopatra	.....	Cont.	O. Tug	12- 4-18	7- 2-19	.....	....	....	143-0	x 29-5	x 17-6	....
1233	Volant	.....	Cont.	O. Tug	12-21-18	10- 6-19	.....	....	....	143-0	x 29-5	x 17-6	....

Foundation Co., Newark, N. J.

120	Bologan	3,500	Cont.	Ferris	8-29-18	5-1-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
121	Bugaya	3,500	Cont.	Ferris	8-29-18	3-27-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
122	Folsom	3,500	Cont.	Ferris	10-22-18	7-10-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
123	Tolo	3,850	Cont.	Ferris	10-22-18	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
124	Acrema	3,500	Cont.	Ferris	11-16-18	7-31-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½

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1919 Construction Record of U. S. Yards

Gildersleeve Ship Construction Co., Gildersleeve, Conn.

Hull No.	Name	Dead-weight tonnage	Contract or requisitioned	Type	Date launched actual or estimated	Date delivered actual or estimated	Speed, knots	H. P., shaft or indicated	Fuel	Length between perpendiculars, Beam molded, Depth molded, feet, inches			Draft ft. in.
262	Battahatchee	3,500	Cont.	Ferris	10-5-18	6-28-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
263	Gildersleeve	3,500	Cont.	Ferris	7-14-19	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	....

Groton Iron Works, Noank, Conn.

127	Berea	3,500	Cont.	Ferris	9-7-18	6-30-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
128	Cuyos	3,500	Cont.	Ferris	1-16-19	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	....
129	Caskata	3,500	Cont.	Ferris	8-20-19	9-12-19	.....	....	....	268-0	x 45-2	x 26-0	....
130	Controller	3,500	Cont.	Ferris	12-5-19	1-20	.....	....	....	268-0	x 45-2	x 26-0	....
131	Salamis	3,500	Cont.	Ferris	12-5-19	1-20	.....	....	....	268-0	x 45-2	x 26-0	....
132	Bedford	3,500	Cont.	Ferris	1-20	2-20	.....	....	....	268-0	x 45-2	x 26-0	....

Housatonic Shipbuilding Co., Stratford, Conn.

455	Fairfield	3,500	Cont.	Ferris	12-31-18	8-30-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	....
456	Sanpa	3,500	Cont.	Ferris	2-27-19	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	....
457	Seres	3,500	Cont.	Ferris	4-17-19	4-17-19	.....	....	....	268-0	x 45-2	x 26-0	....
458	Isto	3,500	Cont.	Ferris	4-3-19	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	....
459	Ganeri	3,500	Cont.	Ferris	1-30-19	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	....
460	Albee	3,500	Cont.	Ferris	5-22-19	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	....

Johnson Shipyard Corp., Mariner's Harbor, N. Y.

276	Aowa	3,500	Cont.	Ferris	7-16-18	6-2-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
277	Busurga	3,500	Cont.	Ferris	11-14-18	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	....
278	Chenango	3,500	Cont.	Ferris	3-26-19	8-2-19	.....	....	....	268-0	x 45-2	x 26-0	....
2305	Tompkinsville	2,500	Cont.	Barge	6-14-19	10-16-19	.....	....	....	229-5	x 37-0	x 20-6	....

Kingston Shipbuilding Corp., Kingston, N. Y.

272	Esopus	3,500	Cont.	Ferris	9-30-18	7-31-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
273	Catskill	3,500	Cont.	Ferris	5-29-19	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	....
274	Iskum	3,500	Cont.	Ferris	8-21-19	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	....

Ship Construction & Trading Co., Inc., Stonington, Conn.

137	Attura	3,500	Cont.	Ferris	3-15-19	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
138	Ashland	3,500	Cont.	Ferris	6-7-19	10-10-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½

Traylor Shipbuilding Co., Cornwells, Pa.

181	Daram	3,500	Cont.	Ferris	10-19-18	12-28-18	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
182	Tanka	3,500	Cont.	Ferris	12-18-18	3-10-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
183	Oraton	3,500	Cont.	Ferris	2-12-19	4-8-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
184	Seypen	3,500	Cont.	Ferris	4-10-19	5-23-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½

Continental Shipbuilding Corp., Yonkers, Y. Y.

2049	Hastnai	1,500	Cont.	Continental	4-16-19	9-12-19	.....	....	....	212-0	x 38-6	x 20-6	....

A. C. Brown & Sons, Tottenville, N. Y.

2750	Persistence	.....	Cont.	Harbor tug	10-11-19	12-20-19	.....	....	Coal	94-10	x 24-0	x 14-2	....
2751	Prowess	.....	Cont.	Harbor tug	10-11-19	1-1-20	.....	....	Coal	94-10	x 24-0	x 14-2	....
2752	Daring	.....	Cont.	Harbor tug	10-25-19	1-10-20	.....	....	Coal	94-10	x 24-0	x 14-2	....
2753	Force	.....	Cont.	Harbor tug	12-1-19	2-20	.....	....	Coal	94-10	x 24-0	x 14-2	....
2754	Valor	.....	Cont.	Harbor tug	12-5-19	2-20	.....	....	Coal	94-10	x 24-0	x 14-2	....

Consolidated Shipbuilding Corp., Morris Heights, N. Y.

2470	Foreman	.....	Cont.	Harbor tug	5-29-19	12-20-19	.....	....	Coal	94-10	x 24-0	x 14-2	....
2471	Dragoman	.....	Cont.	Harbor tug	5-15-19	12-20-19	.....	....	Coal	94-10	x 24-0	x 14-2	....
2472	Drayman	.....	Cont.	Harbor tug	9-11-19	1-10-20	.....	....	Coal	94-10	x 24-0	x 14-2	....
2473	Helmsman	.....	Cont.	Harbor tug	11-11-19	1-20-20	.....	....	....	94-10	x 24-0	x 14-2	....

International Shipbuilding & Marine Engineering Corp., Nyack, N. Y.

2449	Messenger	.....	Cont.	Harbor tug	6-7-19	12-25-19	.....	....	Coal	94-10	x 24-0	x 14-2	....
2450	Porter	.....	Cont.	Harbor tug	5-15-19	1-5-20	.....	....	Coal	94-10	x 24-0	x 14-2	....
2451	Propeller	.....	Cont.	Harbor tug	6-21-19	12-25-19	.....	....	Coal	94-10	x 24-0	x 14-2	....
2452	Driver	.....	Cont.	Harbor tug	11-1-19	1-15-20	.....	....	Coal	94-10	x 24-0	x 14-2	....
2453	Hauler	.....	Cont.	Harbor tug	9-30-19	1-15-20	.....	....	Coal	94-10	x 24-0	x 14-2	....

John H. Mathis Co., Camden, N. J.

2704	Whistler	.....	Cont.	Harbor tug	6-12-19	12-25-19	.....	....	Coal	94-0	x 24-0	x 14-2	....
2705	Wizard	.....	Cont.	Harbor tug	7-13-19	1-1-20	.....	....	Coal	94-0	x 24-0	x 14-2	....
2706	Talisman	.....	Cont.	Harbor tug	8-21-19	1-20-20	.....	....	Coal	94-0	x 24-0	x 14-2	....

John W. Sullivan, New York

2697	Highflyer	.....	Cont.	Harbor tug	5-15-19	12-25-19	.....	....	Coal	94-10	x 24-0	x 14-2	....
2698	Rattler	.....	Cont.	Harbor tug	7-14-19	1-5-20	.....	....	Coal	94-10	x 24-0	x 14-2	....

Middle Atlantic District

Maryland Shipbuilding Co., Baltimore

99	Guilford	3,500	Cont.	Ferris	10-15-18	5- 1-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
100	Arundel	3,500	Cont.	Ferris	1-11-19	6- 9-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
101	Quana	3,500	Cont.	Ferris	6- 6-19	7- 7-19	.....	.....	....	268-0	x 45-2	x 26-0	....
102	Armistead	3,500	Cont.	Ferris	8-14-19	8-26-19	.....	.....	....	268-0	x 45-2	x 26-0	....

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1919 Construction Record of U.S. Yards

Missouri Bridge & Iron Co., Quantico, Va.

Hull No.	Name	Dead-weight tonnage	Contract or requisitioned	Type	Date launched actual or estimated	Date delivered actual or estimated	Speed, knots	H. P., shaft or indicated	Fuel	Length between perpendiculars, Beam molded, Depth molded, feet, inches			Draft ft. in.
303	Abra	3,500	Cont.	Ferris	5-31-19	5-31-19	.....	.....	....	268-0	x 45-2	x 26-0	....
304	Bargo	3,500	Cont.	Ferris	7-16-19	7-17-19	.....	.....	....	268-0	x 45-2	x 26-0	....

North Carolina Shipbuilding Co., Inc., Morehead City, N. C.

370	Dassalan	3,500	Cont.	Ferris	10-31-18	5-15-19	10.00	.....	Coal	268-0	x 45-2	x 26-0	....
371	Sassacus	3,500	Cont.	Ferris	5- 7-19	7- 4-19	.....	.....	....	268-0	x 45-2	x 26-0	....

Henry Smith & Sons Co., Baltimore

293	Aquasco	3,500	Cont.	Ferris	4- 7-19	4-22-19	.....	.....	....	268-0	x 45-2	x 26-0	....
294	Barrilla	3,500	Cont.	Ferris	6- 3-19	7-29-19	.....	.....	....	268-0	x 45-2	x 26-0	....

C. H. Tenney & Co., Hampton, Va.

173	Luray	3,500	Cont.	Ferris	1-21-19	4-17-19	.....	.....	....	268-0	x 45-2	x 26-0	....
174	Ahoka	3,500	Cont.	Ferris	5-15-19	7- 1-19	.....	.....	....	268-0	x 45-2	x 26-0	....

York River Shipbuilding Co., West Point, Va.

415	Agram	3,500	Cont.	Ferris	7-29-19	9-10-19	.....	.....	....	268-0	x 45-2	x 26-0	....
416	R. L. Newman	3,500	Cont.	Ferris	7- 8-19	8-27-19	.....	.....	....	268-0	x 45-2	x 26-0	....

Coastwise Shipbuilding Co., Baltimore

2141	Sherwood	2,500	Cont.	Barge	7-19-19	8-25-19	.....	.....	....	229-5	x 37-0	x 20-6	....
2142	Catonsville	2,500	Cont.	Barge	10-25-19	11- 6-19	.....	.....	....	229-5	x 37-0	x 20-6	....
2143	Carrall	2,500	Cont.	Barge	12-15-19	12-31-19	.....	.....	....	229-5	x 37-0	x 20-6	....

H. E. Crook Co., Inc., Baltimore

2594	Druid Hill	2,500	Cont.	Barge	11-15-19	12- 8-19	.....	.....	....	229-5	x 37-0	x 20-6	....
2595	Ruxton	2,500	Cont.	Barge	12- 1-19	12-15-19	.....	.....	....	229-5	x 37-0	x 20-6	....

Whitehaven Shipbuilding Co., Whitehaven, Md.

2413	Whitehaven	2,500	Cont.	Barge	9-18-19	11-12-19	.....	.....	....	229-5	x 37-0	x 20-6	....
2414	Monokin	2,500	Cont.	Barge	10-29-19	11-20-19	.....	.....	....	229-5	x 37-0	x 20-6	....

Chance Marine Construction Co., Annapolis, Md.

2662	Reindeer	.....	Cont.	H. tug	11-15-19	12-30-19	.....	.....	Coal	94-10	x 24-0	x 14-2	....
2663	Racehorse	.....	Cont.	H. tug	12- 8-19	1-30-20	.....	.....	Coal	94-10	x 24-0	x 14-2	....
2664	Stallion	.....	Cont.	H. tug	12-22-19	1-15-20	.....	.....	Coal	94-10	x 24-0	x 14-2	....

M. M. Davis & Sons, Inc., Solomons, Md.

1207	Artisan	.....	Cont.	Ocean tug	10-12-18	4- 1-19	.....	.....	Coal	125-0	x 29-0	x 15-0	....
1208	Craftsman	.....	Cont.	Ocean tug	12- 9-18	6-30-19	.....	.....	Coal	125-0	x 29-0	x 15-0	....
1211	Guardsman	.....	Cont.	Ocean tug	3- 8-19	8-21-19	.....	.....	Coal	125-0	x 29-0	x 15-0	....
1212	Custodian	.....	Cont.	Ocean tug	4-19-19	9- 9-19	.....	.....	Coal	125-0	x 29-0	x 15-0	....
1213	Woodman	.....	Cont.	Ocean tug	1-18-19	7-31-19	.....	.....	Coal	125-0	x 29-0	x 15-0	....

Vinyard Shipbuilding Co., Milford, Del.

2701	Lightning	.....	Cont.	Harbor tug	8-11-19	12-20-19	.....	.....	Coal	94-10	x 24-0	x 14-2	....

Southern District

American Shipbuilding Co., Brunswick, Ga.

188	Casmalia	3,500	Cont.	Ferris	9-2-18	7-16-18	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
189	Alcovy	3,500	Cont.	Ferris	12-24-18	7-22-19	.....	....	....	268-0	x 45-2	x 26-0	....
190	Tenas	3,500	Cont.	Ferris	7-17-19	9-9-19	.....	....	....	268-0	x 45-2	x 26-0	....
1008	Bridgewater	3,500	Cont.	Ferris	4-5-19	7-22-19	.....	....	....	268-0	x 45-2	x 26-0	....

Morey & Thomas, Jacksonville, Fla.

380	Tyee	3,500	Cont.	Ferris	11-11-18	8-4-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
381	Kusdeca	3,500	Cont.	Ferris	12-24-18	5-24-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2277	Chion	3,500	Cont.	Ferris	4-8-19	8-4-19	.....	....	....	268-0	x 45-2	x 26-0	....

J. M. Murdock, Jacksonville, Fla.

2045	Fort George	3,500	Cont.	Ferris	1-30-19	10-15-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2046	Fort Lauderdale	3,500	Cont	Ferris	4-10-19	12-20-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½

St. Johns River Shipyard Co., Jacksonville, Fla.

139	Baxley	3,500	Cont.	Ferris	7-22-18	9-30-18	8.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
140	Caribou	3,500	Cont.	Ferris	9-19-18	9-4-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
141	Mayport	3,500	Cont.	Ferris	11-16-18	8-4-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
142	Wayhut	3,500	Cont.	Ferris	12-31-18	9-4-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2099	Fort Pierce	3,500	Cont.	Ferris	7-16-19	9-4-19	.....	....	....	268-0	x 45-2	x 26-0	....
2101	Anastasia	2,500	Cont.	Barge	8-19-19	9-22-19	.....	....	....	.....	....	....	....
2102	Ormond	2,500	Cont.	Barge	10-17-19	10-28-19	.....	....	....	.....	....	....	....
2103	Daytona	2,500	Cont.	Barge	9-24-19	10-28-19	.....	....	....	.....	....	....	....

Tampa Dock Co., Tampa, Fla.

202	Coulter	3,500	Cont.	Ferris	10-18-18	7-22-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2095	Fort Dade	3,500	Cont.	Ferris	8-23-19	11-7-19	.....	....	....	268-0	x 45-2	x 26-0	....
203	Hoosac	3,500	Cont.	Ferris	5-14-19	11-20-19	.....	1400 I	....	268-0	x 45-2	x 26-0	23-10½

United States Maritime Corp., Brunswick, Ga.

364	Euharlee	3,500	Cont.	Ferris	10-10-18	8-4-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
365	Fernandina	3,500	Cont.	Ferris	11-12-18	8-4-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
366	Weequabic	3,500	Cont.	Ferris	3-20-19	7-22-19	.....	....	....	268-0	x 45-2	x 26-0	....

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1919 Construction Record of U. S. Yards

Gibbs Gas Engine Co., Jacksonville, Fla.

Hull No.	Name	Dead-weight tonnage	Contract or requisitioned	Type	Date launched actual or estimated	Date delivered actual or estimated	Speed, knots	H. P., shaft or indicated	Fuel	Length between perpendiculars	Beam molded	Depth molded, feet, inches	Draft ft. in.
2691	Hawk	.....	Cont.	Harbor tug	10-16-19	1-20	.....	....	Coal	.....	....	....	....
2692	Condor	.....	Cont.	Harbor tug	10-23-19	1-20	.....	....	Coal	.....	....	....	....
2693	Buzzard	.....	Cont.	Harbor tug	.....	2-20	.....	....	Coal	.....	....	....	....
2694	Cockatoo	.....	Cont.	Harbor tug	.....	2-20	.....	....	Coal	.....	....	....	....

Southland Steamship Co., Savannah, Ga.

1381	Director	.....	Cont.	Ocean tug	8-31-18	12-25-19	.....	....	Coal	.....	....	....	....
1382	Laborer	.....	Cont.	Ocean tug	10-3-18	7-24-19	.....	....	Coal	.....	....	....	....

Alabama Dry Dock & Shipbuilding Co., Mobile, Ala.

333	Alta	3,500	Cont.	Ferris	1-13-19	6-17-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½

Dantzler Shipbuilding & Dry Dock Co., Inc., Moss Point, Miss.

637	Boone	3,500	Cont.	Ferris	8-15-18	7-22-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
638	Moss Point	3,500	Cont.	Ferris	10-19-18	6-24-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
639	Escatawpa	3,500	Cont.	Ferris	11-30-19	12-30-19	.....	....	Coal	268-0	x 45-2	x 26-0	....
640	Aberfoil	3,500	Cont.	Ferris	1-15-19	8-29-19	.....	....	Coal	268-0	x 45-2	x 26-0	....

Dierks-Blodgett Shipbuilding Co., Pascagoula, Miss.

281	Cawker	3,500	Cont.	Ferris	9-4-18	12-30-18	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
282	Berela	3,500	Cont.	Ferris	11-17-18	6-12-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
283	Panga	3,500	Cont.	Ferris	2-28-19	8-2-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½

Hodge Ship Co., Inc., Moss Point, Miss.

348	Bararan	3,500	Cont.	Ferris	1-24-19	7-10-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
349	Boonsborough	3,500	Cont.	Ferris	9-18-18	7-25-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½

Jahncke Shipbuilding Co., Madisonville, La.

211	Balabac	3,500	Cont.	Ferris	9-29-18	5-24-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
212	Pontchartrain	3,500	Cont.	Ferris	4-6-19	10-7-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
213	Abbeville	3,500	Cont.	Ferris	1-19-19	8-26-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
214	Tchefuncta	3,500	Cont.	Ferris	9-20-19	12-25-19	.....	....	....	268-0	x 45-2	x 26-0	....

Murnan Shipbuilding Co., Mobile, Ala.

342	Alcay	3,500	Cont.	Ferris	12-1-19	12-25-19	.....	....	....	268-0	x 45-2	x 26-0	....
343	Bacong	3,500	Cont.	Ferris	12-10-19	1-1-19	.....	....	....	268-0	x 45-2	x 26-0	....

American Lumber Co., Millville, Fla.

2431	Millville	2,500	Cont.	Barge	6-28-19	12-25-19	.....	....	....	229-5	x 37-0	x 20-6	....

Gulf District

Beaumont Shipbuilding & Dry Dock Co., Beaumont, Tex.

448	Swampscott	3,500	Cont.	Ferris	5-30-18	5-8-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
449	Quemahoning	3,500	Cont.	Ferris	11-16-18	6-3-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
450	Angelina	3,500	Cont.	Ferris	3-11-19	6-19-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2119	Awash	3,500	Cont.	Ferris	9-29-19	11-20-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	....
2127	Shelby	2,000	Cont.	Barge	11-1-19	12-30-19	.....	....	....	229-5	x 37-0	x 20-6	....
2128	Shellbark	2,000	Cont.	Barge	11-10-19	1-5-20	.....	....	....	229-5	x 37-0	x 20-6	....

Heldenfels Bros., Rockport, Tex.

643	Baychester	3,500	Cont.	Ferris	7-31-19	12-25-19	.....	....	....	268-0	x 45-2	x 26-0	....
644	Zuniga	3,500	Cont.	Ferris	9-9-19	12-25-19	.....	....	....	268-0	x 45-2	x 26-0	....
645	Jasper	3,500	Cont.	Ferris	11-1-19	1-20	.....	....	....	268-0	x 45-2	x 26-0	....
646	Klatawa	3,500	Cont.	Ferris	11-15-19	1-20	.....	....	....	268-0	x 45-2	x 26-0	....

Lone Star Shipbuilding Co., Beaumont, Tex.

264	Batavas	3,500	Cont.	Ferris	2-13-19	6-20-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
265	Arado	3,500	Cont.	Ferris	8-29-18	4-7-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
266	Arambi	3,500	Cont.	Ferris	11-2-18	5-22-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
268	Westminster	3,500	Cont.	Ferris	9-30-19	11-10-19	....	....	....	268-0	x 45-2	x 26-0	....
269	Bonair	3,500	Cont.	Ferris	12-15-19	12-30-19	10.00	....	Coal	268-0	x 45-2	x 26-0	....

J. N. McCammon, Beaumont, Tex.

328	Hasbe	3,500	Cont.	Ferris	9-19-19	10-27-19	.....	....	....	268-0	x 45-2	x 26-0	....
329	Cambodia	3,500	Cont.	Ferris	11-6-19	11-26-19	.....	....	....	268-0	x 45-2	x 26-0	....

Midland Bridge Co., Houston, Tex.

358	Katonah	3,500	Cont.	Ferris	7-3-18	7-8-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
359	Batino	3,500	Cont.	Ferris	8-10-18	5-28-19	.....	....	....	268-0	x 45-2	x 26-0	....
360	Cochin	3,500	Cont.	Ferris	9-4-18	9-4-19	.....	....	....	268-0	x 45-2	x 26-0	....
361	Bluffton	3,500	Cont.	Ferris	10-17-18	9-4-19	.....	....	....	268-0	x 45-2	x 26-0	....
362	Fort Worth	3,500	Cont.	Ferris	12-26-18	8-1-19	.....	....	....	268-0	x 45-2	x 26-0	....
363	Wicasta	3,500	Cont.	Ferris	5-18-19	5-21-19	.....	....	....	268-0	x 45-2	x 26-0	....
2107	Austin	3,500	Cont.	Ferris	9-29-19	11-12-19	....	....	....	268-0	x 45-2	x 26-0	....
2108	Nicetown	3,500	Cont.	Ferris	12-1-19	1-1-20	.....	....	....	268-0	x 45-2	x 26-0	....
2109	Matagorda	2,500	Cont.	Barge	6-14-19	8-22-19	....	....	....	229-5	x 37-0	x 20-6	....
2110	Aransas	2,500	Cont.	Barge	8-21-19	10-3-19	....	....	....	229-5	x 37-0	x 20-6	....

National Shipbuilding Co., Orange, Tex.

236	Beechland	4,700	Cont.	Daugherty	7-25-18	4-9-19	10.00	....	Coal	300-0	x 48-0	x 28-6	24-0
237	Zavallo	4,700	Cont.	Daugherty	8-28-18	2-22-19	10.00	....	Coal	300-0	x 48-0	x 28-6	24-0
238	Cowardin	4,700	Cont.	Daugherty	9-17-18	4-30-19	10.00	....	Coal	300-0	x 48-0	x 28-6	24-0
239	Neahsco	4,700	Cont.	Daugherty	10-5-18	4-30-19	10.00	....	Coal	300-0	x 48-0	x 28-6	24-0
240	Horado	4,700	Cont.	Daugherty	11-19-18	9-5-19	10.00	....	Coal	300-0	x 48-0	x 28-6	24-0
241	Nawitka	4,700	Cont.	Daugherty	12-21-18	5-14-19	10.00	....	Coal	300-0	x 48-0	x 28-6	24-0
242	Itompa	4,700	Cont.	Daugherty	2-6-19	6-11-19	10.00	....	Coal	300-0	x 48-0	x 28-6	24-0
243	Natenna	4,700	Cont.	Daugherty	2-27-19	7-16-19	10.00	....	Coal	300-0	x 48-0	x 28-6	24-0
244	Alderman	4,700	Cont.	Daugherty	3-29-19	7-21-19	10.00	....	Coal	300-0	x 48-0	x 28-6	24-0
245	Argenta	4,700	Cont.	Daugherty	5-10-19	8-1-19	10.00	....	Coal	300-0	x 48-0	x 28-6	24-0

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1919 Construction Record of U.S. Yards

Southern Dry Dock & Shipbuilding Co., Orange, Tex.

Hull No.	Name	Dead-weight tonnage	Contract or requisitioned	Type	Date launched actual or estimated	Date delivered actual or estimated	Speed, knots	H. P., shaft or indicated	Fuel	Length between perpendiculars,	Beam molded,	Depth molded, feet, inches	Draft ft. in.
351	Gonzalis	3,500	Cont.	Ferris	10-16-18	11-10-19	.....	....	....	268-0	x 45-2	x 26-0	....
352	Arevas	3,500	Cont.	Ferris	8-17-18	4-25-19	.....	....	....	268-0	x 45-2	x 26-0	....
353	Cahaba	3,500	Cont.	Ferris	7-10-19	12-20-19	.....	....	....	268-0	x 45-2	x 26-0	....
354	Winnsboro	3,500	Cont.	Ferris	2-12-19	8-20-19	.....	....	....	268-0	x 45-2	x 26-0	....
355	Perro	3,500	Cont.	Ferris	8-19-19	10-18-19	.....	....	....	268-0	x 45-2	x 26-0	....
2363	Delphus	3,500	Cont.	Ferris	10-30-19	1-1-20	.....	....	....	268-0	x 45-2	x 26-0	....

Union Bridge & Construction Co., Morgan City, La.

204	La Forge	3,500	Cont.	Ferris	5-30-18	5-26-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
205	Amoron	3,500	Cont.	Ferris	7-4-18	10-7-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
206	Barugo	3,500	Cont.	Ferris	10-26-18	3-26-19	.....	....	....	268-0	x 45-2	x 26-0	....
207	Bolikow	3,500	Cont.	Ferris	11-16-18	3-26-19	.....	....	....	268-0	x 45-2	x 26-0	....
208	Utina	3,500	Cont.	Ferris	5-29-19	7-18-19	.....	....	....	268-0	x 45-2	x 26-0	....
209	Pyramus	3,500	Cont.	Ferris	6-12-19	7-18-19	.....	....	....	268-0	x 45-2	x 26-0	....
2005	Iberia	2,500	Cont.	Barge	7-15-19	8-11-19	.....	....	....	229-5	x 37-0	x 20-6	....
2006	Vermillion	2,500	Cont.	Barge	8-12-19	8-23-19	.....	....	....	229-5	x 37-0	x 20-6	....
2007	Ramos	2,500	Cont.	Barge	8-26-19	9-15-19	.....	....	....	229-5	x 37-0	x 20-6	....

Universal Shipbuilding Co., Houston Ship Channel, Tex.

157	Nacogdoches	3,500	Cont.	Ferris	4-6-18	1-1-20	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
158	Basco	3,500	Cont.	Ferris	5-15-18	12-15-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
159	Banicua	3,500	Cont.	Ferris	7-16-18	11-28-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
160	Barias	3,500	Cont.	Ferris	8-29-18	9-24-19	....	1400 I	....	268-0	x 45-2	x 26-0	....
161	Damacan	3,500	Cont.	Ferris	7-30-19	1-10-20	.....	....	....	268-0	x 45-2	x 26-0	....
162	Dardora	3,500	Cont.	Ferris	12-15-19	1-15-20	.....	....	....	268-0	x 45-2	x 26-0	....
165	Sonia	3,500	Cont.	Ferris	12-20-19	1-20	.....	....	....	268-0	x 45-2	x 26-0	....
166	Runonta	3,500	Cont.	Ferris	9-27-19	1-20	.....	....	....	268-0	x 45-2	x 26-0	....
167	Allaire	3,500	Cont.	Ferris	12-25-19	2-20	.....	....	....	268-0	x 45-2	x 26-0	....

McBride & Law, Beaumont, Tex.

169	Beaumont	3,500	Cont.	Ferris	6-28-18	2-28-19	10.00	1400 I	Coal	268-0	x45-2	x 26-0	23-10½
170	Quapaw	3,500	Cont.	Ferris	8-5-18	4-28-19	10.00	1400 I	Coal	268-0	x45-2	x 26-0	23-10½
171	Broshears	3,500	Cont.	Ferris	12-1-19	1-1-20	.....	....	....	268-0	x 45-2	x 26-0	....

South Pacific District

Benicia Shipbuilding Corp., Benicia, Cal.

488	Cerrito	3,500	Cont.	Ferris	1-30-19	7-12-19	.....	....	....	268-0	x 45-2	x 26-0	....
489	Kimta	3,500	Cont.	Ferris	9-21-18	5-22-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2220	Koosawin	3,500	Cont.	Ferris	9-23-19	12-30-19	.....	....	....	268-0	x 45-2	x 26-0	....

Ralph J. Chandler Co., Wilmington, Cal.

1035	Buckhorn	3,500	Cont.	Ferris	11-19-18	1-29-19	8.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
1036	Redlands	3,500	Cont.	Ferris	2-12-19	5-7-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2259	Massasoit	3,500	Cont.	Ferris	5-27-19	6-11-19	.....	....	....	268-0	x 45-2	x 26-0	....
2260	Nakoni	3,500	Cont.	Ferris	9-12-19	10-15-19	.....	....	....	268-0	x 45-2	x 26-0	....

Coos Bay Shipbuilding Co., Marshfield, Oreg.

454	Mesa	4,400	Cont.	Hough	8-2-18	8-19-19	.....	....	....	274-0	x 45-0	x 28-0	....
1286	Banks de	3,850	Cont.	Ferris	10-19-18	8-1-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
1287	Burnwood	3,850	Cont.	Ferris	11-30-18	2-5-19	.....	....	....	268-0	x 45-2	x 26-0	....
2190	Pamunkey	3,850	Cont.	Ferris	3-26-18	4-2-19	.....	....	....	268-0	x 45-2	x 26-0	....
2191	Pashewah	3,850	Cont.	Ferris	5-3-19	5-20-19	.....	....	....	268-0	x 45-2	x 26-0	....
2192	Samaset	3,850	Cont.	Ferris	6-14-19	8-22-19	.....	....	....	268-0	x 45-2	x 26-0	....
2193	Setangya	3,550	Cont.	Ferris	7-15-19	8-29-19	.....	....	....	268-0	x 45-2	x 26-0	....

Fulton Shipbuilding Co., Wilmington, Cal.

433	Mono	4,000	Cont.	Hough	7-5-18	1-16-19	8.00	1400 I	Coal	274-0	x 45-0	x 28-0	....
435	Cocopa	4,000	Cont.	Hough	8-19-18	1-18-19	.....	....	....	274-0	x 45-0	x 28-0	....
1388	Waneyarda	.....	Cont.	Ferris	11-21-18	6-5-19	8.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
1389	Wenakee	.....	Cont.	Ferris	1-16-19	4-24-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2157	Wovoka	3,500	Cont.	Ferris	4-15-19	7-19-19	.....	....	....	268-0	x 45-2	x 26-0	....
2158	Admete	3,500	Cont.	Ferris	5-29-19	8-5-19	.....	....	....	268-0	x 45-2	x 26-0	....
2845	Lynnhaven	3,500	Cont.	Ferris	6-30-19	8-5-19	.....	....	....	268-0	x 45-2	x 26-0	....

Hammond Lumber Co., Humbolt Bay, Cal.

647	Saris	3,500	Cont.	Ferris	9-13-18	2-25-19	8.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
648	Darrah	3,500	Cont.	Ferris	11-14-18	4-19-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2261	Amata	3,500	Cont.	Ferris	4-17-19	5-9-19	.....	....	....	268-0	x 45-2	x 26-0	....
2262	Octora	3,500	Cont.	Ferris	6-20-19	7-15-19	.....	....	....	268-0	x 45-2	x 26-0	....
2263	Apama	3,500	Cont.	Ferris	8-7-19	8-28-19	10.00	....	Coal	268-0	x 45-2	x 26-0	....

Kruse & Banks Shipbuilding Co., North Bend, Oreg.

431	Gainax	4 000	Cont.	Hough	8-3-18	8-28-18	.....	....	Coal	274-0	x 45-0	x 28-0	....
2129	Fort Leavenworth	3,500	Cont.	Ferris	10-19-18	7-23-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2130	Fort Logan	3,500	Cont.	Ferris	12-5-18	9-10-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2131	Fort Laramie	3,500	Cont.	Ferris	3-15-19	4-15-19	.....	....	Coal	268-0	x 45-2	x 26-0	....
2132	Fort Lewis	3,500	Cont.	Ferris	5-27-19	7-7-19	.....	....	Coal	268-0	x 45-2	x 26-0	....

Rolph Shipbuilding Co., Humbolt Bay, Cal.

1214	Burmont	3,500	Cont.	Ferris	7-24-19	10-21-19	.....	....	....	268-0	x 45-2	x 26-0	....
1215	Burnham	3,500	Cont.	Ferris	5-3-19	10-13-19	.....	....	....	268-0	x 45-2	x 26-0	....
2378	Cremna	3,500	Cont.	Ferris	10-11-19	10-31-19	.....	....	....	268-0	x 45-2	x 26-0	....
2379	Cremona	3,500	Cont.	Ferris	12-25-19	1-20	.....	....	....	268-0	x 45-2	x 26-0	....
2380	Creslone	3,500	Cont.	Ferris	12-25-19	1-20	.....	....	....	268-0	x 45-2	x 26-0	....

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1919 Construction Record of U. S. Yards

North Pacific District

Allen Shipbuilding Co., Seattle

Hull No.	Name	Dead-weight tonnage	Contract or requisitioned	Type	Date launched actual or estimated	Date delivered actual or estimated	Speed, knots	H. P., shaft or indicated	Fuel	Length between perpendiculars,	Beam molded,	Depth molded, feet, inches	Draft ft. in.
1228	Bosworth	3,650	Cont.	Allen	8-26-18	6-26-19	10.00	1400 I	Coal	274-6	x 43-8	x 26-4	23-10½
2038	Allenhurst	3,650	Cont.	Allen	12-7-18	2-15-19	.....	....	....	274-6	x 43-8	x 26-4	.....
2188	Ahmik	3,650	Cont.	Allen	4-3-19	4-10-19	.....	....	....	274-6	x 43-8	x 26-4	.....
	Barbare Bros., Tacoma, Wash.												
1235	Battineau	3,500	Cont.	Ferris	9-30-18	8-5-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
1236	Boughton	3,500	Cont.	Ferris	1-21-19	4-7-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
2685	Imukfa	3,500	Cont.	Ferris	5-20-19	5-31-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
	Grant Smith-Porter Ship Co., Aberdeen, Wash.												
291	Aiken	3,500	Cont.	Ferris	8-4-18	1-10-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
292	Authera	3,500	Cont.	Ferris	8-24-18	2-20-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2180	Fort Snelling	3,500	Cont.	Ferris	9-23-18	6-16-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2181	Fort Seward	3,500	Cont.	Ferris	10-19-18	7-7-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2182	Fort Stanevix	3,500	Cont.	Ferris	11-5-18	4-25-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
2183	Abilla	3,500	Cont.	Ferris	3-5-19	5-7-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
2184	Abnoba	3,500	Cont.	Ferris	4-30-19	5-29-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
2185	Abydos	3,500	Cont.	Ferris	5-13-19	5-17-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
2186	Academia	3,500	Cont.	Ferris	5-30-19	6-25-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
	Grays Harbor Motorship Corp., Aberdeen, Wash.												
999	Brompton	4,000	Cont.	Grays Harbor	6-26-18	4-18-19	8.00	1400 I	Coal	274-6	x 47-10	x 28-1½	25-4
1001	Brookdale	4,000	Cont.	Grays Harbor	8-8-18	1-8-19	10.00	1400 I	Coal	274-6	x 47-10	x 28-1½	25-4
1059	Brookfield	4,000	Cont.	Grays Harbor	8-28-18	4-22-19	8.00	1400 I	Coal	274-6	x 47-10	x 28-1½	25-4
1060	Brookhaven	4,000	Cont.	Grays Harbor	10-17-19	5-3-19	10.00	1400 I	Coal	274-6	x 47-10	x 28-1½	25-4
1061	Brookland	4,000	Cont.	Grays Harbor	10-25-18	6-11-19	10.00	1400 I	Coal	274-6	x 47-10	x 28-1½	25-4
1062	Brookside	4,000	Cont.	Grays Harbor	12-18-18	7-7-19	10.00	1400 I	Coal	274-6	x 47-10	x 28-1½	25-4
1892	Grayling	4,000	Cont.	Grays Harbor	11-17-18	7-16-19	10.00	1400 I	Coal	274-6	x 47-10	x 28-1½	25-4
1893	Gray Eagle	4,000	Cont.	Grays Harbor	1-15-19	8-6-19	10.00	1400 I	Coal	274-6	x 47-10	x 28-1½	25-4
1894	Mannahocking	4,000	Cont.	Grays Harbor	4-1-19	9-5-19	10.00	1400 I	Coal	274-6	x 47-10	x 28-1½	25-4
1895	Gray Cloud	4,000	Cont.	Grays Harbor	4-13-19	9-26-19	10.00	1400 I	Coal	274-6	x 47-10	x 28-1½	25-4
2677	Adria	4,100	Cont.	Grays Harbor	5-10-19	6-11-19	.....	....	....	274-6	x 47-10	x 28-2	....
2678	Agron	4,100	Cont.	Grays Harbor	5-24-19	6-19-19	.....	....	....	274-6	x 47-10	x 28-2	....
2680	Agylla	4,100	Cont.	Grays Harbor	6-7-19	7-18-19	.....	....	....	274-6	x 47-10	x 28-2	....
	Meacham & Babcock Shipbuilding Co., Seattle												
951	Wayucan	3,500	Cont.	Ferris	7-4-18	12-30-18	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
952	Tolca	3,500	Cont.	Ferris	8-22-18	1-15-19	8.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
953	Afalkey	3,500	Cont.	Ferris	9-23-18	7-10-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
954	Ardena	3,500	Cont.	Ferris	10-30-18	6-14-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2525	Capraria	3,500	Cont.	Ferris	3-19-19	6-3-19	.....	....	....	268-0	x 45-2	x 26-0	....
2526	Cardia	3,500	Cont.	Ferris	4-10-19	6-5-19	.....	....	....	268-0	x 45-2	x 26-0	....
2527	Corus	3,500	Cont.	Ferris	6-12-19	8-26-19	.....	....	....	268-0	x 45-2	x 26-0	....
2528	Cenina	3,500	Cont.	Ferris	6-26-19	9-28-19	.....	....	....	268-0	x 45-2	x 26-0	....
2687	Chalcis	3,500	Cont.	Ferris	7-22-19	12-20-19	.....	....	....	268-0	x 45-2	x 26-0	....
2688	Charnis	3,500	Cont.	Ferris	10-18-19	12-25-19	.....	....	....	268-0	x 45-2	x 26-0	....
	Nilson & Kelez Shipbuilding Corp., Seattle												
467	Octorara	3,500	Cont.	Ferris	8-22-18	12-28-18	8.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
468	Adway	3,500	Cont.	Ferris	9-30-18	6-26-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2139	Cineas	3,500	Cont.	Ferris	12-5-18	4-12-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
2140	Chyras	3,500	Cont.	Ferris	4-28-19	5-26-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
	Pacific-American Fisheries Co., South Bellingham, Wash.												
1202	Bobring	3,500	Cont.	Pacific American Fisheries	8-17-18	1-29-19	8.00	1500 I	Coal	268-4	x 45-2	x 26-0	24-0
1203	Bockonoff	3,500	Cont.	Pacific American Fisheries	10-1-18	3-27-19	8.00	1500 I	Coal	268-4	x 45-2	x 26-0	24-0
1204	Bonneteere	3,500	Cont.	Pacific American Fisheries	11-2-18	5-16-19	10.00	1500 I	Coal	268-4	x 45-2	x 26-0	24-0
1205	Bon Secour	3,500	Cont.	Pacific American Fisheries	1-30-19	7-16-19	10.00	1500 I	Coal	268-4	x 45-2	x 26-0	24-0
2064	Clio	3,500	Cont.	Pacific American Fisheries	3-22-19	9-18-19	10.00	1500 I	Coal	268-4	x 45-2	x 26-0	24-0
2332	Clodia	3,500	Cont.	Pacific American Fisheries	3-31-19	11-29-19	10.00	1500 I	Coal	268-4	x 45-2	x 26-0	24-0
	Puget Sound Bridge & Dredging Co., Seattle												
1113	Blakeley	4,000	Cont.	Grays Harbor	11-7-18	7-8-19	10.00	1400 I	Coal	274-6	x 47-10	x 28½	....
1114	Brookwood	4,000	Cont.	Grays Harbor	1-11-19	11-15-19	10.00	1400 I	Coal	274-6	x 47-10	x 28½	....
1115	Snoqualmie	5,000	Cont.	Geary	8-11-19	8-21-19	.....	....	....	315-0	x 48-0	x 32-2½	....
1117	Broxton	5,000	Cont.	Geary	9-22-19	9-26-19	.....	....	....	315-0	x 48-0	x 32-2½	....
	Sanderson & Porter, Raymond, Wash.												
89	Forduco	3,500	Cont.	Ferris	6-3-18	2-17-19	.....	....	....	268-0	x 45-2	x 26-0	....
90	Kenosha	3,500	Cont.	Ferris	7-20-18	7-22-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	....
91	Pezuta	3,500	Cont.	Ferris	8-28-18	7-1-19	.....	....	Coal	268-0	x 45-2	x 26-0	....
92	Addison	3,500	Cont.	Ferris	10-5-18	4-3-19	.....	....	....	268-0	x 45-2	x 26-0	....
93	Anthon	3,500	Cont.	Ferris	11-9-18	4-30-19	.....	....	....	268-0	x 45-2	x 26-0	....
94	Bingamon	3,500	Cont.	Ferris	1-14-19	5-19-19	.....	....	....	268-0	x 45-2	x 26-0	....
95	Biscayne	3,500	Cont.	Ferris	3-15-19	5-8-19	.....	....	....	268-0	x 45-2	x 26-0	....
96	Kitan	3,500	Cont.	Ferris	4-1-19	7-3-19	.....	....	....	268-0	x 45-2	x 26-0	....
97	Black Wolf	3,500	Cont.	Ferris	5-26-19	6-20-19	.....	....	....	268-0	x 45-2	x 26-0	....
98	Blandford	3,500	Cont.	Ferris	6-23-19	6-30-19	.....	....	....	268-0	x 45-2	x 26-0	....

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1919 Construction Record of U. S. Yards

Seaborn Shipyards Co., Tacoma, Wash.

Hull No.	Name	Dead-weight tonnage	Contract or requisitioned	Type	Date launched actual or estimated	Date delivered actual or estimated	Speed, knots	H. P., shaft or indicated	Fuel	Length between perpendiculars,	Beam molded,	Depth molded, feet, inches	Draft ft. in.
2135	Fort Riley	3,500	Cont.	Ferris	10-10-18	5-27-19	8.00	1400 I	Coal	268-0	x 45-2	x 26-0	....
2136	Fort Russell	3,500	Cont.	Ferris	11-6-18	6-9-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	....
2198	Puyallup	3,500	Cont.	Ferris	3-20-19	5-5-19	.....	....	....	268-0	x 45-2	x 26-0	....
2199	Chesterfield	3,500	Cont.	Ferris	4-17-19	5-3-19	.....	....	....	268-0	x 45-2	x 26-0	....
2200	Vincennes	3,500	Cont.	Ferris	5-14-19	5-29-19	.....	....	....	268-0	x 45-2	x 26-0	....
2201	Oelwein	3,500	Cont.	Ferris	6-4-19	6-14-19	.....	....	....	268-0	x 45-2	x 26-0	....

Sloan Shipyards Corp., Anacortes, Wash.

43	Asotin	3,500	Cont.	Ferris	2-6-19	8-15-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
44	Leoti	3,500	Cont.	Ferris	5-28-19	5-30-19	.....	....	....	268-0	x 45-2	x 26-0	....
45	Bertrand	3,500	Cont.	Ferris	6-26-19	7-3-19	.....	....	....	268-0	x 45-2	x 26-0	....
46	Bayden	3,500	Cont.	Ferris	7-31-19	8-10-19	.....	....	....	268-0	x 45-2	x 26-0	....

Sloan Shipyards Corp., Olympia, Wash.

39	Sewickley	3,500	Cont.	Ferris	7-4-18	5-13-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
40	Mahnet	3,500	Cont.	Ferris	9-20-18	8-6-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
41	Himato	3,500	Cont.	Ferris	12-19-18	9-3-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
42	Hyannis	3,500	Cont.	Ferris	4-14-19	9-15-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
47	Conewago	3,500	Cont.	Ferris	5-12-19	9-18-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10
48	Cozian	3,500	Cont.	Ferris	5-26-19	5-30-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
49	Cabacan	3,500	Cont.	Ferris	6-24-19	6-27-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
50	Dacula	3,500	Cont.	Ferris	7-28-19	8-6-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½

Tacoma Shipbuilding Co., Tacoma, Wash.

544	Coloma	3,500	Cont.	Ferris	7-4-18	12-28-18	8.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
545	Fassett	3,500	Cont.	Ferris	7-25-18	9-6-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
546	Fort Wright	3,500	Cont.	Ferris	10-3-18	7-11-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2221	Fort Harrison	3,500	Cont.	Ferris	12-26-18	3-15-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
2222	Fort Jackson	3,500	Cont.	Ferris	3-27-19	3-27-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
2223	Fort Union	3,500	Cont.	Ferris	4-17-19	4-19-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½
2224	Dione	3,500	Cont.	Ferris	5-7-19	5-10-19	.....	....	....	268-0	x 45-2	x 26-0	23-10½

Wright Shipbuilding Co., Tacoma, Wash.

491	Eyota	3,500	Cont.	Ferris	6-10-18	6-4-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
1363	Bourneville	3,500	Cont.	Ferris	7-4-18	12-1-18	.....	....	....	268-0	x 45-2	x 26-0	....
1364	Bowesmont	3,500	Cont.	Ferris	9-20-18	12-31-18	.....	....	....	268-0	x 45-2	x 26-0	....
2089	Elestra	3,500	Cont.	Ferris	12-24-18	2-1-19	.....	....	....	268-0	x 45-2	x 26-0	....
2090	Elissa	3,500	Cont.	Ferris	4-5-19	4-6-19	.....	....	....	268-0	x 45-2	x 26-0	....
2315	Endymion	3,500	Cont.	Ferris	5-23-19	6-1-19	.....	....	....	268-0	x 45-2	x 26-0	....

Oregon District

Coast Shipbuilding Co., Portland, Oreg.

61	Cabeza	3,500	Cont.	Ferris	7-10-18	1-10-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
62	Cabura	3,500	Cont.	Ferris	8- 1-18	8-29-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
1031	Boxbutte	3,500	Cont.	Ferris	12-17-18	7-22-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
1032	Boykin	3,500	Cont.	Ferris	1-18-19	6-16-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
1033	Aspenhill	3,500	Cont.	Ferris	3- 3-19	9- 6-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
1034	Boynton	3,500	Cont.	Ferris	4-19-19	1-20	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½

Feeney & Bremer Co., Inc., Tillamook, Oreg.

542	Bedloe	3,500	Cont.	Ferris	1- 7-19	3-15-19	.....	.....	....	268-0	x 45-2	x 26-0	....

Grant Smith-Porter Ship Co., Portland, Oreg.

1359	Latoka	3,500	Cont.	Ferris	8-19-18	1-24-19	.....	1400 I	....	268-0	x 45-2	x 26-0	23-10½
1360	Medford	3,500	Cont.	Ferris	8-29-18	1-24-19	.....	1400 I	....	268-0	x 45-2	x 26-0	23-10½
1361	Kanakee	3,500	Cont.	Ferris	9- 5-18	6-20-19	.....	1400 I	....	268-0	x 45-2	x 26-0	23-10½
1362	Kokomo	3,500	Cont.	Ferris	9-14-18	6-30-19	.....	1400 I	....	268-0	x 45-2	x 26-0	23-10½
2172	Fort Scott	3,500	Cont.	Ferris	9-30-18	6-26-19	.....	1400 I	....	268-0	x 45-2	x 26-0	23-10½
2173	Fort Stevens	3,500	Cont.	Ferris	9-21-18	5-13-19	.....	1400 I	....	268-0	x 45-2	x 26-0	23-10½
2174	Fort Sill	3,500	Cont.	Ferris	11- 9-18	5-20-19	.....	1400 I	....	268-0	x 45-2	x 26-0	23-10½
2175	Fort Smith	3,500	Cont.	Ferris	10-19-18	5-14-19	.....	1400 I	....	268-0	x 45-2	x 26-0	23-10½
2176	Afrania	3,500	Cont.	Ferris	11-21-18	5-27-19	8.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2177	Agarista	3,500	Cont.	Ferris	1-22-19	5-28-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2178	Ahala	3,500	Cont.	Ferris	12-30-18	6- 5-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2179	Aleis	3,500	Cont.	Ferris	2- 4-19	6-14-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2270	Alector	3,500	Cont.	Ferris	3- 6-19	7-16-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2271	Aculeo	3,500	Cont.	Ferris	2-17-19	6-28-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2272	Acarman	3,500	Cont.	Ferris	6-26-19	7-22-19	.....	.....	....	268-0	x 45-2	x 26-0	23-10½
2273	Aburia	3,500	Cont.	Ferris	4- 3-19	7-26-19	.....	.....	....	268-0	x 45-2	x 26-0	23-10½

McEachern Ship Co., Astoria, Oreg.

661	Makarda	3,500	Cont.	Hough	6-12-18	2-20-19	8.00	1400 I	Coal	274-0	x 45-0	x 28-0	....
662	Benvala	3,500	Cont.	Hough	7- 4-18	2-23-19	8.00	1400 I	Coal	274-0	x 45-0	x 28-0	....
663	Cotteral	3,500	Cont.	Hough	7- 4-18	3-13-19	8.00	1400 I	Coal	274-0	x 45-0	x 28-0	....
664	Klamath	3,500	Cont.	Hough	9-11-18	4-18-19	8.00	1400 I	Coal	274-0	x 45-0	x 28-0	....
665	Flavel	3,500	Cont.	Hough	10- 5-18	5-23-19	10.00	1400 I	Coal	274-0	x 45-0	x 28-0	....
666	Mahanna	3,500	Cont.	Hough	11-20-18	6-23-19	10.00	1400 I	Coal	274-0	x 45-0	x 28-0	....
667	Alleben	3,500	Cont.	Hough	5-12-19	7-28-19	.....	.....	....	274-0	x 45-0	x 28-0	....
668	Aroturus	3,500	Cont.	Hough	5-27-19	7-25-19	.....	.....	....	274-0	x 45-0	x 28-0	....
2311	Cabria	3,500	Cont.	Ferris	6-13-19	8-29-19	.....	.....	....	268-0	x 45-0	x 26-0	....

Peninsula Shipbuilding Co., Portland, Oreg.

35	Clackamas	4,000	Cont.	Peninsula	2-25-18	12-20-19	12.00	.....	Coal	269-0	x 48-8	x 27-6	....
37	Bell Brook	4,000	Cont.	Peninsula	3-27-18	10-31-19	12.00	.....	Coal	269-0	x 48-8	x 27-6	....
38	Cresap	4,000	Cont.	Peninsula	5- 2-18	8- 4-19	12.00	.....	Coal	269-0	x 48-8	x 27-6	....
1095	Braeburn	4,000	Cont.	Peninsula	7-23-18	7-21-19	12.00	.....	Coal	269-0	x 48-8	x 27-6	....
1096	Braxton	4,000	Cont.	Peninsula	8-20-18	8-18-19	12.00	.....	Coal	269-0	x 48-8	x 27-6	....
1097	Coryallis	4,000	Cont.	Peninsula	11- 9-18	8-16-19	12.00	.....	Coal	269-0	x 48-8	x 27-6	....
1098	Brentwood	4,000	Cont.	Peninsula	12- 5-18	9- 9-19	12.00	.....	Coal	269-0	x 48-8	x 27-6	....
2165	Corone	4,000	Cont.	Peninsula	6-21-19	12-29-19	12.00	1400 I	Coal	269-0	x 48-8	x 27-6	....
2166	Cartona	4,000	Cont.	Peninsula	7-12-19	12-30-19	10.00	1400 I	Coal	269-0	x 48-8	x 27-6	....
2167	Cossa	4,000	Cont.	Peninsula	1-20	1-20	10.00	.....	Coal	269-0	x 48-8	x 27-6	....
2168	Cotys	4,000	Cont.	Peninsula	1-20	1-20	10.00	.....	Coal	269-0	x 48-8	x 27-6	....

George F. Rodgers & Co., Astoria, Oreg.

469	Blue Eagle	3,500	Cont.	Ferris	7- 4-18	8-11-19	10.00	1400 I	Coal	268-0	x 45-0	x 26-0	23-10½
470	Capines	3,500	Cont.	Ferris	10- 8-18	8-25-19	10.00	1400 I	Coal	268-0	x 45-0	x 26-0	23-10½
471	Nunra	3,500	Cont.	Ferris	4-30-19	12-25-19	10.00	1400 I	Coal	268-0	x 45-0	x 26-0	23-10½
472	Wonahbe	3,500	Cont.	Ferris	5-29-19	1-20	10.00	1400 I	Coal	268-0	x 45-0	x 26-0	23-10½

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1919 Construction Record of U. S. Yards

Sommarstrom Shipbuilding Co., Columbia City, Oreg.

Hull No.	Name	Dead-weight tonnage	Contract or requisitioned	Type	Date launched actual or estimated	Date delivered actual or estimated	Speed, knots	H. P., shaft or indicated	Fuel	Length between perpendiculars,	Beam molded,	Depth molded, feet, inches	Draft ft. in.
437	Musketo	3,500	Cont.	Hough	5-14-18	3-22-19	10.00	1400 I	Coal	274-0	x 45-0	x 28-0	23-6
438	Matrapan	3,500	Cont.	Hough	6-11-18	2- 4-19	10.00	1400 I	Coal	274-0	x 45-0	x 28-0	23-6
439	Maratanza	3,500	Cont.	Hough	7- 4-18	3-29-19	10.00	1400 I	Coal	274-0	x 45-0	x 28-0	23-6
440	Wanzu	3,500	Cont.	Hough	7- 4-18	3-31-19	10.00	1400 I	Coal	274-0	x 45-0	x 28-0	23-6
2521	Dardania	3,500	Cont.	Ferris	12-16-18	8-23-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2522	Datis	3,500	Cont.	Ferris	1-22-19	9- 5-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
2523	Daulis	3,500	Cont.	Ferris	5-28-19	7-12-19	.....	.....	....	268-0	x 45-2	x 26-0	23-10½

G. M. Standifer Construction Corp., Portland, Oreg.

17	Umatilla	3,500	Cont.	Ferris Twin-screw	7-13-18	8-15-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
18	Montezuma	3,500	Cont.	Ferris Twin-screw	7-13-18	10- 2-19	.....	.....	....	268-0	x 45-2	x 26-0	....
20	Aryonia	3,500	Cont.	Ferris Twin-screw	7-13-18	10- 2-19	.....	.....	....	268-0	x 45-2	x 26-0	....
2816	Wabanaquot	3,500	Cont.	Ferris	1-23-19	7- 2-19	.....	.....	....	268-0	x 45-2	x 26-0	....
2817	Akanaquint	3,500	Cont.	Ferris	4-26-19	7- 2-19	.....	.....	....	268-0	x 45-2	x 26-0	....
2818	Kudapasan	3,500	Cont.	Ferris	5- 3-19	7- 2-19	.....	.....	....	268-0	x 45-2	x 26-0	....

G. M. Standifer Construction Corp., Vancouver, Wash.

22	Benzonia	3,500	Cont.	Ferris Twin-screw	7-13-18	6-13-19	10.00	.....	Coal	268-0	x 45-2	x 26-0	23-10½
23	Moosabee	3,500	Cont.	Ferris Twin-screw	7-13-18	9-16-19	10.00	.....	Coal	268-0	x 45-2	x 26-0	23-10½
24	Kangi	3,500	Cont.	Ferris Twin-screw	7-20-18	6-25-19	10.00	.....	Coal	268-0	x 45-2	x 26-0	23-10½
25	Okiya	3,500	Cont.	Ferris Twin-screw	9-23-18	7-26-19	10.00	.....	Coal	268-0	x 45-2	x 26-0	23-10½
26	Aimwell	3,500	Cont.	Ferris Twin-screw	10- 9-18	7- 8-19	10.00	.....	Coal	268-0	x 45-2	x 26-0	23-10½
1121	Buskong	4,500	Cont.	Ballin	11-23-18	5-19-19	10.00	.....	Coal	295-7¼	x 44-6	x 26-0	....
1122	Bushrod	4,500	Cont.	Ballin	4-28-19	6-28-19	10.00	.....	Coal	295-7¼	x 44-6	x 26-0	....
1123	Butte	4,500	Cont.	Ballin	5- 5-19	8-19-19	10.00	.....	Coal	295-7¼	x 44-6	x 26-0	....
1124	Buttonwood	4,500	Cont.	Ballin	1- 4-19	5-29-19	10.00	.....	Coal	295-7¼	x 44-6	x 26-0	....
1125	Byfield	4,500	Cont.	Ballin	7-23-19	9-30-19	10.00	.....	Coal	295-7¼	x 44-6	x 26-0	....
1126	Mendora	4,500	Cont.	Ballin	8-12-19	1-20	10.00	.....	Coal	295-7¼	x 44-6	x 26-0	....

St. Helens Shipbuilding Co., St. Helens, Oreg.

482	Colindo	3,500	Cont.	Ferris	11-16-18	9-19-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	....
2137	Fort Sheridan	3,500	Cont.	Ferris	2-12-19	7- 8-19	.....	.....	....	268-0	x 45-2	x 26-0	....
2138	Fort Shaw	3,500	Cont.	Ferris	4-19-19	8-11-19	.....	.....	....	268-0	x 45-2	x 26-0	....

Supple-Ballin Shipbuilding Corp., Portland, Oreg.

231	Ashburn	4,000	Cont.	Ballin	8- 1-18	2-21-19	9.00	1500 I	Coal	295-7¼	x 43-0	x 26-0	....
232	Awensdaw	4,000	Cont.	Ballin	11- 4-18	3- 5-19	.....	1500 I	Coal	295-7¼	x 43-0	x 26-0	....
233	Birchleaf	4,000	Cont.	Ballin	12-14-18	5-16-19	10.00	1500 I	Coal	295-7¼	x 43-0	x 26-0	....
2194	Dertona	4,500	Cont.	Ballin	4-10-19	6-14-19	10.00	1600 I	Coal	295-7¼	x 43-0	x 26-0	....
2195	Deva	4,500	Cont.	Ballin	4-29-19	8-30-19	10.00	1600 I	Coal	295-7¼	x 43-0	x 26-0	....
2196	Diana	4,500	Cont.	Ballin	5-15-19	9-27-15	10.00	1600 I	Coal	295-7¼	x 43-0	x 26-0	....

Wilson Shipbuilding Co., Astoria, Oreg.

446	Bonifay	3,500	Cont.	Ferris	7- 4-18	4-16-19	10.00	1400 I	Coal	268-0	x 45-2	x 26-0	23-10½
1458	Wakiki	3,500	Cont.	Ferris	9- 2-19	9-27-19	10.00	.....	Coal	268-0	x 45-2	x 26-0	23-10½
1459	Owatama	3,500	Cont.	Ferris	12-18-18	12-25-19	10.00	.....	Coal	268-0	x 45-2	x 26-0	23-10½
1460	Onteora	3,500	Cont.	Ferris	4-30-19	8-11-19	.....	.....	....	268-0	x 45-2	x 26-0	23-10½
2291	Egeria	3,500	Cont.	Ferris	8-20-19	1-20	.....	.....	....	268-0	x 45-2	x 26-0	23-10½

Great Lakes District

Burger Boat Co., Manitowoc, Wis.

2571	Retriever	....	Cont.	Harbor Tug	3-15-19	10-18-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2572	Terrier	.....	Cont.	Harbor Tug	4- 5-19	10- 6-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2573	Setter	.....	Cont.	Harbor Tug	7-22-19	11-19-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2574	Pointer	.....	Cont.	Harbor Tug	8-28-19	12-25-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2575	Spaniel	.....	Cont.	Harbor Tug	7-17-19	12-15-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2576	Beagle	.....	Cont.	Harbor Tug	10-22-19	1-15-20	.....	450 I	Coal	94-10	x 24-0	x 14-2	....

Dachel-Carter Boat Co., Benton Harbor, Mich.

2516	Badger	.....	Cont.	Harbor Tug	7- 3-19	12-10-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2517	Leopard	.....	Cont.	Harbor Tug	7-26-19	12-15-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....

Leatham & Smith Towing & Wrecking Co., Sturgeon Bay, Wis.

2154	Energy	.....	Cont.	Harbor Tug	12- 5-18	9-13-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2155	Diligent	....	Cont.	Harbor Tug	12-16-18	10-30-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2156	Active	.....	Cont.	Harbor Tug	1- 4-19	9-29-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2784	Bison	.....	Cont.	Harbor Tug	4-25-19	11- 7-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2785	Bullock	.....	Cont.	Harbor Tug	6- 5-19	11-15-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2786	Ox	.....	Cont.	Harbor Tug	6-19-19	12-15-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2787	Bear	.....	Cont.	Harbor Tug	9-13-19	1- 5-20	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2788	Burro	.....	Cont.	Harbor Tug	11-25-19	2-10-20	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2789	Camel	.....	Cont.	Harbor Tug	12- 1-19	2-10-20	.....	450 I	Coal	94-10	x 24-0	x 14-2	....

Northwest Engineering Works, Green Bay, Wis.

481	Toller	....	Cont.	O. Tug	8-15-18	5- 9-19	.....	450 I	Coal	125-0	x 27-0	x 14-6	....
2071	Vanguard	.....	Cont.	Harbor Tug	11-16-18	9-15-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2072	Sampson	....	Cont.	Harbor Tug	12-19-18	10-15-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2073	Mastiff	.....	Cont.	Harbor Tug	12-31-18	10-10-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2074	Guardian	.....	Cont.	Harbor Tug	2- 7-19	9-22-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2804	Salem	.....	Cont.	Harbor Tug	2-21-19	11- 8-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2805	Ashwaubemie	.....	Cont.	Harbor Tug	3-11-19	7-26-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2806	Suamico	.....	Cont.	Harbor Tug	3-27-19	8-14-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2807	Tomah	.....	Cont.	Harbor Tug	6-11-19	11-15-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2808	Green Bay	.....	Cont.	Harbor Tug	7-31-19	11-15-19	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2809	Pottawotomie	....	Cont.	Harbor Tug	8-20-19	1-20-20	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2810	Fort Howard	.....	Cont.	Harbor Tug	9-18-19	1-30-20	.....	450 I	Coal	94-10	x 24-0	x 14-2	....
2811	Allouez	.....	Cont.	Harbor Tug	11-15-19	2-20-20	.....	450 I	Coal	94-10	x 24-0	x 14-2	....

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Activities in the Marine Field

Latest News From Ships and Shipyards

Ice May Make Navigation Opening Late

BY CAPTAIN MARTINGALE

ICE at the Soo is 30 inches thick, heavier than it has been for many years and teams are constantly crossing from the American to the Canadian side and vice versa. The ice in Mud lake is approximately 25 inches thick while snow in the woods about the Soo is 3½ feet deep on the level. Lightkeeper Carlson, who has been stationed at Whitefish point for the past 17 years, states that the ice is the heaviest he has ever seen in that vicinity. There is a large amount of ice at the lower end of Lake Superior while the ice in Lake Michigan and the Straits of Mackinaw is also reported heavy. Ice in the lower part of the Detroit river is solid from bank to bank and no open water is reported in Lake Erie. Marine men predict that the opening of navigation will be late on account of the ice.

* * *

Work at Buffalo of unloading the winter storage cargo of wheat from the steamer SIR THOMAS SHAUGHNESSY, of the Jenkins fleet, began recently. She has approximately 300,000 bushels in her hold. She is the third winter storage boat to be called to an elevator at Buffalo this season. About 16 storage cargoes remain to be unloaded.

* * *

The Montreal Transportation Co. recently purchased the steamer VALCARTIER from the Algoma Central Steamship lines, Sault Ste. Marie, Ont. While the purchase price was not stated, it is understood that it was comparatively high. The VALCARTIER formerly was the W. H. MACK and was owned by the Jenkins Steamship Co.

* * *

The annual meeting of the Great Lakes Towing Co. was held at Jersey City, N. J., Feb. 4. L. C. Hanna Jr., was elected a director to succeed his father, the late L. C. Hanna. All the other directors were re-elected.

* * *

Among the leading bankers of the country who were invited recently by Chairman Payne of the shipping board to serve on a committee to interest the investing public in shipping securities, F. H. Goff, Cleveland, was included. Mr. Payne stated that the shipping board was confronted with the problem of selling ships aggregating in value $2,000,000,000. This figure, Chairman Payne claims, is many times the purchasing power of private shipping interests.

* * *

A slight improvement in the freight car situation at Superior and Duluth has been reported by dock operators. This is said to be a result largely of strong protests made by the trade to the railroad administration. The docks are being supplied with more cars than formerly, the result of which is that coal has been moving out more freely toward the northwest.

* * *

During the year 1919, the Lake Carriers' association paid 19 death benefits amounting to $3325. This is the largest amount paid out for any year since 1916. The heavy amount for 1919 is due in part to the losses sustained in the wreck of the JOHN OWEN.

New Ship Names

WHEN the navigation season opens for 1920, many familiar vessel names will be missing as new names for several boats have been substituted. Following are the names of a number of vessels that have been recently changed:

New name	Old name
Liberty	Phenix
G. A. Mitchell	Edward Smith
Frank Seither	R. W. England
Muriel W.	Veronica
Eric W.	Harry E. Packer
Starmount	Avon
Captain Dan	Helca
Glencairn	Granville A. Richardson
Blenbrae	Brazil
Glenstriven	America
Vinmount	Vulcan
Alex B. Uhrig	Centurion
Maple Grove	Cherokee
A. E. R. Schneider	Charles R. Van Hise
Glencadem	F. P. Jones

* * *

The Northern Coal & Dock Co. is making preparations to rebuild its wrecked bridge in dock section No. 3 on Connor's point, Superior. The cost of this undertaking is estimated at approximately $125,000. The new bridge will have a concrete and steel trestle for the unloading towers. A short bridge also will be built in the No. 2 dock section. It is thought that the work will be completed by the opening of navigation in the spring.

* * *

The steamer CHARLES R. VAN HISE, which is to be lengthened 96 feet at the Ashtabula, O., yards of the Great Lakes Engineering works, was placed in drydock recently.

* * *

Iron ore for 1920 delivery advanced $1 a ton recently. A number of sales have already been made at the new figures which are $7.45 a ton for old range bessemer ores, $7.20 a ton for Mesabi bessemer, $6.70 a ton for old range nonbessemer and $6.55 for Mesabi nonbessemer.

* * *

Detroit soon is to have one of the most powerful wireless stations on the Great Lakes, according to a recent announcement to the effect that the navy department has authorized bids for its construction. The station is to be erected on Windmill point at the junction of the Detroit river and Lake St. Clair. It will be powerful enough to pick up wireless messages from any point on the Great Lakes. The new station will be under the management of the Great Lakes division of the United States navy.

* * *

The tug R. FITZGERALD, which was brought back from the Atlantic coast last season, is undergoing repairs at the Great Lakes Towing Co.'s yards. She is being changed from salt to fresh water equipment and will be ready to go into commission by the opening of navigation.

* * *

During August last, while the steamer CADILLAC was in tow of the tug BUFFALO, off Erie, Pa., the stern of the steamer hit a dock. The claim for loss of time incurred, together with the repair bill, amounted to approximately $20,000. The owners of the CADILLAC brought suit and the court recently held the tug solely at fault.

* * *

The passenger steamer LAKELAND, which is undergoing changes to adapt her to the automobile trade, will be ready for operation at the opening of navigation this spring. The work is being done by the Interlake Engineering Co.

* * *

The steamer SULTANA of the Tomlinson fleet is discharging her cargo of storage rye at the Dellwood elevator, Buffalo. Another vessel to be unloaded of storage cargo recently was the CHARLES M. WARNER.

* * *

The steamer NORMANDIE has been sold by the Pringle Barge Line Co., according to a recent announcement. It is understood that the new owners will operate the vessel in the sand trade at Detroit.

* * *

At the close of 1919 navigation, membership of the Lake Carriers' association comprised 382 vessels of 1,982,830 gross tons. Three hundred and nineteen

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of these boats are from Cleveland. Duluth with 18 vessels is second on the list, Buffalo is third and Detroit fourth. But 63 vessels in the association are owned outside of Cleveland.

* * *

The Great Lakes Towing Co. is to add two more ice-breaking tugs to its fleet this season. The boats will be built at the Cleveland yard of the company, work on them starting in the near future. They will be duplicates of the tugs MICHIGAN and PENNSYLVANIA. When the 1920 season opens, the company will have 53 steel and eight wooden tugs in commission. This figure does not include the wrecker FAVORITE. It has not been decided from which ports the new tugs will operate.

* * *

The steamer SARNIAN, formerly the CHILI, is undergoing extensive repairs at the Cowles shipyard, Buffalo. This vessel is owned by the Canada Steamship Lines, Ltd. Two boilers will be taken out, repaired and replaced; two new deck houses, a pilot house and a Texas will be put on and all the hatches will be enlarged. Other minor repairs will also be made.

* * *

The steamer W. L. BROWN recently went into drydock at Ashtabula to have some needed repairs made to her shoe and rudder. Some slight repairs also will be made to her machinery.

Along the Atlantic and Gulf Coasts

THE oil carrier ROANOKE was launched at the yards of the Texas Steamship Co., Bath, Me., recently. This vessel is one of nine large ocean-going ships built by the Texas Co. since 1917. She was 90 per cent complete when launched and was ready for trials within a few weeks after launching. The vessel is 431 feet 10 inches long, 32 feet 9 inches deep and will develop 11½ knots with a maximum of 3100 horsepower. Her cargo capacity is 9220 tons.

* * *

The control of the Coastwise Transportation Co., Boston, together with its fleet of nine vessels has been transferred to the Harriman interests, New York. The fleet's total tonnage is about 88,000.

* * *

A new drydock was put in commission in January at Providence, R. I., by the Marine Engineering & Drydock Co. The first vessel to be placed on the ways for repairs was the U. S. S. FAIRFIELD.

* * *

The New England Maritime Corp. which was organized to inaugurate a service between Boston and San Francisco via the Panama canal, will establish a monthly service about March 1 with the steamer JUNEAU. The service will be extended to include Portland, Me., and calls enroute will be made at Los Angeles. Capt. E. D. Sproul is marine superintendent of the line.

* * *

The service between Boston and St. Johns, N. B., on the Boston & Yarmouth line has been discontinued, according to an announcement made by the Eastern Steamship Co. The company has placed the NORTHLAND in service on a new line to Yarmouth, N. S., leaving Central wharf, Boston.

* * *

A new service is announced between Boston and Hull, England, by the Rogers & Webb line. One steamer has already been allocated for this purpose and the United States shipping board has given assurance of other vessels in the near future.

* * *

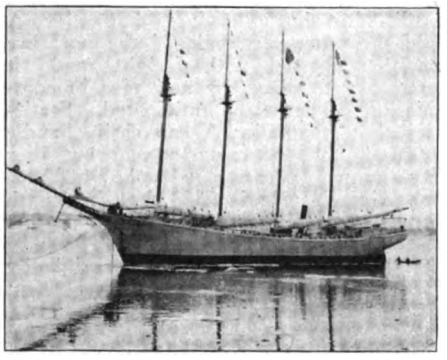
The first wooden craft to be launched in 1920 in the Bath, Me., district was the 4-masted schooner AMELIA ZEMAN which took the water recently at the yards of Frank S. Bowker & Sons, Phippsburg Center, Me. She was launched ready for sea and will be commanded by Capt. V. V. Black, Sargentville, Me., who is one of the youngest commanders in the coastwise service. The vessel is 178.3 feet long, 37 feet beam and 15.2 feet deep, with a gross tonnage of 738. She is owned by the A. Z. Navigation Corp., New York.

* * *

A new line has been established between Boston and Manchester, England, by Wilde & Co., Boston, and a fortnightly service is expected to be maintained.

* * *

Plans are being considered for extensive improvements of the port facilities at Harbor Junction, South Providence,



FOUR-MAST SCHOONER AMELIA ZEMAN

R. I. The proposed construction includes three 1000-foot piers, a terminal warehouse and track facilities connecting directly with the New York, New Haven & Hartford railroad. The Eastern Terminal Co. has recently secured a site on Branch avenue, Providence, for constructing a warehouse.

* * *

The 3-masted schooner EMILY S. BAYMORE, Captain Barter, while waiting to be towed from Alma, N. B., grounded and caused some hull damage which was repaired. On again sailing, she was caught in bad weather and was in serious danger off the Maine coast, when the coast guard picked her up and towed her to Portland, Me.

* * *

The United States shipping board announces that, because of the great demand for marine engineers, it will continue indefinitely the free marine engineering school at Tulane university, New Orleans. The new term opened Feb. 2, with Stanley Thomas Hall and Prof. James M. Robert in charge. This is the only shipping board engineering school in the South, and, since its establishment in 1917, has graduated hundreds of engine room officers into the merchant marine.

* * *

A record in cargo carried and in time of loading was established by the American steamer ABRAHAM LINCOLN at New Orleans in January, when she took on 32,380 bales of cotton, the largest cotton cargo ever shipped in one vessel from the Louisiana port, in 12 days, docking at six different wharves to take on the cargo. She cleared for Genoa, under command of Capt. W. H. Bevan. W. H. Cowley, New Orleans agent for the American Steamship Co., consigned and handled the vessel, which was built at the Pusey & Jones yard, Wilmington, Del., and has a gross tonnage of 8166, being 455 feet long.

* * *

The Brazilian steamship CAMPOS of the Lloyd-Brasiliero Steamship Co., conducted by the Brazilian government, brought 10,000 bags of sugar to New Orleans early in January, on an experimental voyage from Rio to the Louisiana port to survey the possibilities for the establishment of a direct continuous line between the Brazilian port and New Orleans. Jose Pequeno is captain of CAMPOS, which had on board Admiral Cordeiro da Graca, retired, of the Portuguese navy, who came as representative of the Brazilian government, to discuss with New Orleans bankers and shipping men, the possibilities for the new line. The ship has a crew of 81.

* * *

The Fred T. Ley Co., operating a concrete shipyard at Mobile, Ala., has added 100 men to its force. The company is at work on its third concrete hull.

* * *

NIKA, first ship of the Hodge Ship Co., New Orleans, of which O. E. Hodge, Ruston, La., is president, opened the new service between New Orleans and the ports of Ecuador, Colombia and Panama, when she left the Louisiana port, Jan. 19. She carried officials of the company, several guests, and a full complement of cargo. NIKA is a 3500-ton Ferris-type wooden steamer, built

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for the shipping board by the Hodge company at Moss Point, Miss., but taken over by the Hodge company in settlement with the government.

* * *

Steamship towage rates in New Orleans have been increased between 10 and 15 per cent by the New Orleans Towboat Owners' association, according to R. D. Reeves, president of the organization. High prices of fuel and increased wage demands of employes are given as the causes for the increase.

* * *

Longshoremen of New Orleans have agreed, through the representatives of their unions in conference with employers, to leave all wage and other questions, which, heretofore, have resulted in strikes and consequent delay in the business of the port, to arbitration in the future. They have agreed to work during such periods of arbitration and never again to tie up the port facilities as they did during the recent strike. Both white and colored longshoremen signed the agreement.

* * *

The French steamship GAUCHY, first of five of the LeParmentier type, nonsinkable steel vessels built by the Foundation Co., New Orleans, for the French government, has loaded with grain at New Orleans, and left on her maiden voyage for Havre, France

Up and Down the Pacific Coast

PEACE-TIME competition between the ports of the North Pacific is developing and already Portland, Oreg., and Vancouver, B. C., have sent emissaries abroad in an endeavor to attract freight away from Puget sound terminals. Portland is boosting its new terminals in the East and asking importers to route their shipments through that port. The first result of this was the diversion of a full cargo of rubber, originally intended for discharge at Seattle, to the Columbia river. Now Vancouver, B. C., has arranged an excursion of business men to China and Japan, the first event of that kind originating in British Columbia. Vancouver business men desire to make a personal inspection of the oriental field and a large party will soon leave for the Far East with the intention of bringing new trade through the British Columbia gateway.

* * *

Five steel steamers, built in Japan for the Emergency Fleet corporation are now in Seattle undergoing alterations prior to acceptance by the United States. On these vessels about $300,000 is being spent in rearranging quarters, changing from coal to oil burners and in doing other necessary work. The steamers EASTERN GALE and EASTERN GUIDE are being converted to oil burners by the Todd Drydocks, Inc. The Skinner & Eddy Shipbuilding Corp. obtained the contract for similar work on the EASTERN KNIGHT and the EASTERN MOON will be altered by the Pacific Coast Engineering Co. on a bid of $34,100. The latter vessel will remain a coal burner but will have extensive alterations made in her superstructure. The EASTERN MARINER contract is to be awarded in the near future.

* * *

The demand for lumber tonnage is illustrated at Vancouver, B. C., where 300,000 feet were loaded on the oil tanker EL LOBO, for Lobitos, Peru. The EL LOBO brought up a cargo of oil and under ordinary conditions would return in ballast. Shipping lumber on a tanker is something of an experiment and, if successful, it will probably be repeated as long as tonnage is as scarce as at present.

* * *

Water frontage measuring 750 feet has been purchased at Vancouver, B. C., by the Dominion government which will at once erect a $4,000,000 terminal. The property cost approximately $1,000,000. The Canadian government has just inaugurated service between Vancouver and Sydney, N. S. W., and will place three new steamers on this route. They are the CANADIAN IMPORTER, CANADIAN INVENTOR and CANADIAN PROSPECTOR, built at British Columbia yards. The first vessel named will begin the service. This line will supplement the service furnished by the Canadian-Australian lines, whose steamers are being seriously handicapped by the strikes in Australia.

* * *

Seattle's new Smith Cove Pier B, said to be the largest water terminal in the world, went into service in February when the Harrison line steamship CROWN OF TOLEDO was berthed to load 2,000,000 feet of lumber for Glasgow. Pier B will not be fully completed until May but the fact that Pier A and the other terminals of the port are badly congested with freight made it necessary to place the new pier in commission earlier than anticipated. Statistics show that Pier A can easily handle 1,000,000 tons of cargo a year but Pier B's annual capacity will be 1,800,000 tons. Each pier is 2563 feet in length but B has a width of 365 feet as against a width of 310 feet at A. The new terminal, when completed as originally planned, will represent an investment of $2,500,000.

* * *

Complaint by Seattle shipping men concerning the handling of offers to purchase wooden shipping board vessels, lying idle at North Pacific ports, has brought a statement from Chairman John B. Payne that any reasonable offer will receive consideration. Judge Payne intimated that the board would give attention to offers of $75,000 to $90,000 per hull as reasonable. At the present time there are 45 wooden hulls of various designs and in various stages of completion lying in Lake Union, within the city limits of Seattle.

* * *

At a cost in excess of $2,500,000, the Canadian Pacific railroad will construct a new deep sea pier at Vancouver, B. C., this year. The preliminary contract has been awarded. The terminal is to be completed in eight months. The pier will be 2-stories, 350 feet in width and about 2000 feet in length.

* * *

Several Great Lakes built steamers are in the Pacific. The LAKE ELKWATER has just resumed her voyage from Coquimbo for Tacoma, Wash., with a cargo of ore after a serious delay at Balboa due to a damaged propeller. The LAKE GEBHART is fixed for cargo from Iquique to Honolulu thence proceeding to the Columbia river for April loading. The LAKE FITCH is enroute from Antofagasta for Tacoma, Wash., with a cargo of ore.

* * *

Seattle's water commerce totaled $750,000,000 during 1919, a slight loss from 1918, when with war activity that port broke all previous records with a total of $792,000,000. The decrease is less than was expected. The last four months of last year show a gain of $5,500,000 as compared with the same period in the previous year, indicating that the port is on a peace basis which will establish new records during 1920. The 1919 business shows an average of more than $2,000,000 per day.

* * *

New pilotage regulations, effective Jan. 1, providing that coastwise vessels, not under Canadian registry, must pay pilotage dues, have caused much comment on the British Columbia side. As a result of this law, the Grand Trunk Pacific has decided to register its vessels at Prince Rupert, changing from British registry the liners hailing from Newcastle, England. Other companies operating in British Columbia waters are expected to follow suit as the pilotage dues rapidly accumulate.

* * *

With the assignment by the navy of the old gunboat VICKSBURG for a training ship, Washington's nautical school is now in full operation with 60 cadets enrolled and the number is to be doubled in the near future. This is the first state nautical school established on the Pacific coast. Delay was occasioned by the necessary wait for the navy assignment. The ship is in charge of Capt. E. F. Eckhardt, a retired navy officer.

* * *

The annual contribution of the United States to Canada, under the pelagic sealing treaty of 1911, was paid this month when 96 fur sealskins were delivered at Vancouver, B. C. Under the terms of the treaty, the United States agreed to give the Dominion 15 per cent of the gross number of seals taken on the Bering sea islands included in the territory of Alaska.

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Practical Ideas for the Engineer

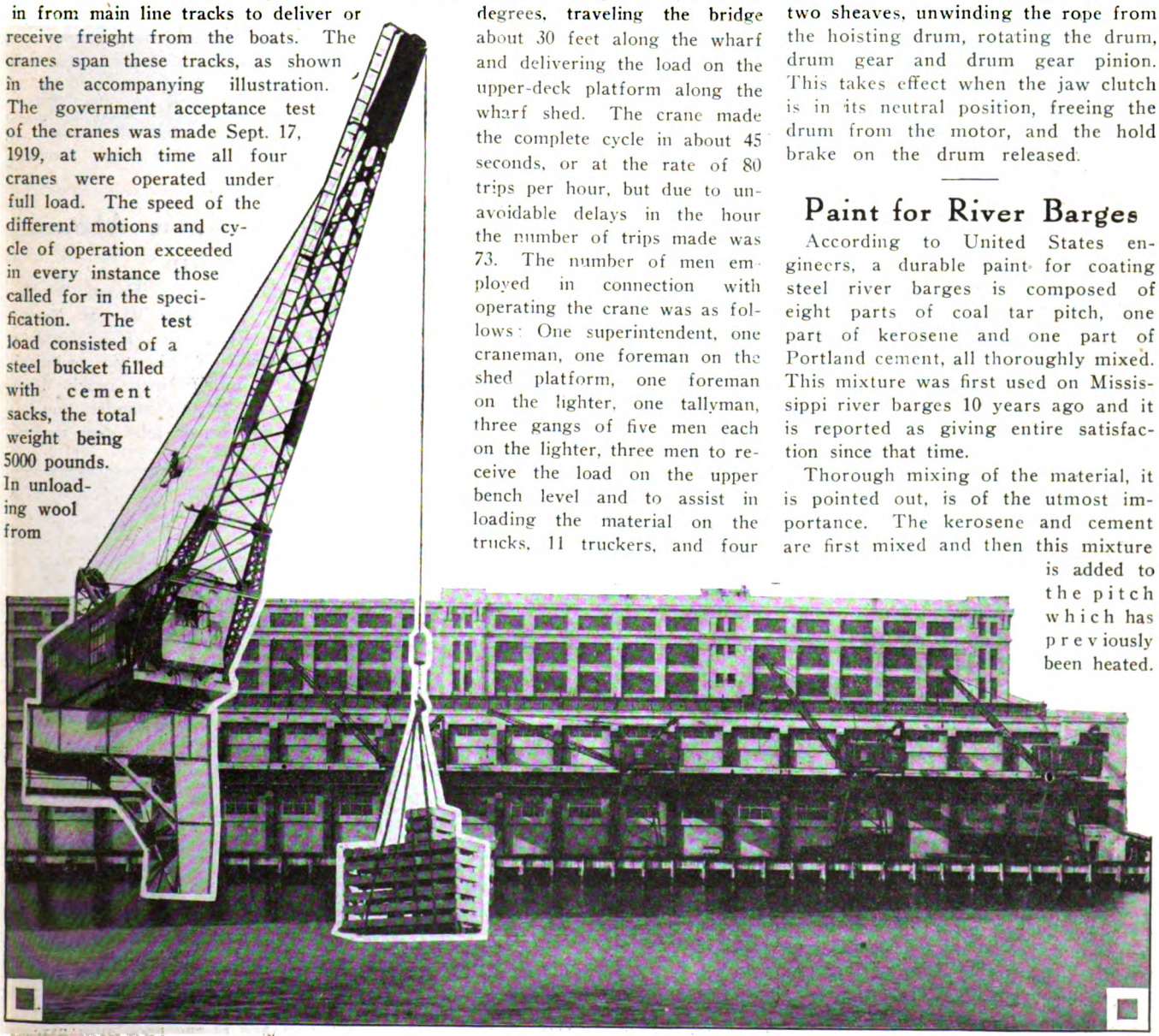
Testing Army Base Cranes—Paint for Barges—Makes Docking Record—Drafting Room Aboard Ship—Improving a Sextant—Rapid Machining Job

CRANES recently installed at the army base, Boston, to handle freight to and from ships, as described in THE MARINE REVIEW for October, were given a thorough test before being accepted by the government. These cranes were built by the Wellman-Seaver-Morgan Co., Cleveland.

The Boston terminal includes a long 8-story warehouse separated by a wide street from the marginal 2-story wharf house alongside the wharf where the ships dock. Between the wharf house and the water is a space 35 feet wide with two standard gage tracks on which freight cars are run in from main line tracks to deliver or receive freight from the boats. The cranes span these tracks, as shown in the accompanying illustration. The government acceptance test of the cranes was made Sept. 17, 1919, at which time all four cranes were operated under full load. The speed of the different motions and cycle of operation exceeded in every instance those called for in the specification. The test load consisted of a steel bucket filled with cement sacks, the total weight being 5000 pounds. In unloading wool from barges on the asme day, one of the cranes made 73 trips an hour taking each trip three bales weighing from 500 to 800 pounds each. It was required to unload the barges evenly making it necessary to take a load alternately from each end and the middle, but landing all loads in the same place. This method of handling meant considerable time spent in bringing or traveling along the dock.

The operation included picking up the wool from a lighter at the wharf side, about on the level of the wharf, making a vertical lift on the hoist line of about 40 feet, rotating the boom through an angle of about 120 degrees, traveling the bridge about 30 feet along the wharf and delivering the load on the upper-deck platform along the wharf shed. The crane made the complete cycle in about 45 seconds, or at the rate of 80 trips per hour, but due to unavoidable delays in the hour the number of trips made was 73. The number of men employed in connection with operating the crane was as follows: One superintendent, one craneman, one foreman on the shed platform, one foreman on the lighter, one tallyman, three gangs of five men each on the lighter, three men to receive the load on the upper bench level and to assist in loading the material on the trucks, 11 truckers, and four men storing the material, making a total of 38 men. Naturally the number of truckers and those required for storing the material is determined by the method of storing and the distance the truckers must travel to deliver the material inside the shed.

The alignment of the hoisting units and the reduction of friction by the use of roller bearings is well illustrated by the following performance: The weight of 375 pounds, consisting of the lifting hook, 2 feet of crane chain, the fall weight and 10 feet of hoisting line, is sufficient to allow the hook to lower at a fair rate of speed and pull the hoisting rope over two sheaves, unwinding the rope from the hoisting drum, rotating the drum, drum gear and drum gear pinion. This takes effect when the jaw clutch is in its neutral position, freeing the drum from the motor, and the hold brake on the drum released.



UNITED STATES ARMY BASE AT BOSTON FROM THE WATER FRONT—THE ILLLUSTRATION AT THE LEFT SHOWS THE TYPE OF CRANE INSTALLED

Paint for River Barges

According to United States engineers, a durable paint for coating steel river barges is composed of eight parts of coal tar pitch, one part of kerosene and one part of Portland cement, all thoroughly mixed. This mixture was first used on Mississippi river barges 10 years ago and it is reported as giving entire satisfaction since that time.

Thorough mixing of the material, it is pointed out, is of the utmost importance. The kerosene and cement are first mixed and then this mixture is added to the pitch which has previously been heated.

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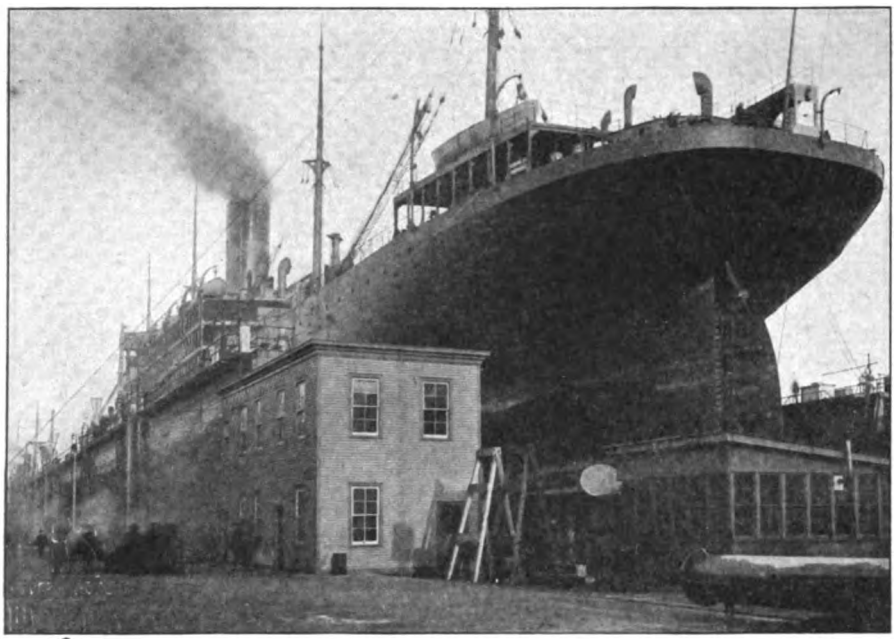


MINNESOTA LIFTED IN 25 MINUTES ACTUAL PUMPING TIME IN THE 30,000-TON FLOATING MORSE DRYDOCK AT BROOKLYN, N. Y.

Before the mixture is applied, the steel plates should be thoroughly cleaned. Then the paint is applied by brushes or mops. Also, it is necessary that the plates be warm when the material is applied. Otherwise a satisfactory job is not possible.

While the mixture is somewhat more expensive to apply than ordinary paint, this is offset by a lesser cost of materials. The material for coating a full-decked steel barge of 600-ton capacity, 135 feet long, 27 feet beam and 7½ feet deep, was recently found to cost approximately $46.

Makes Docking Record

The world's latest record in drydocking achievement was claimed recently when the 30,000-ton floating drydock of the Morse Dry Dock & Repair Co., Brooklyn, N. Y., lifted the American freighter MINNESOTA, the world's greatest deadweight carrier, with a cargo capacity of 30,000 tons, excluding her reserve bunker space.

The successful lifting of the MINNESOTA gave that ship the signal honor of being the largest ship that has as yet tested the strength of a floating drydock. All sections of the 6-section dock of the Morse company were commissioned in the work of raising her hulk in the air, and only 25 minutes of actual pumping time was consumed. The rapidity with which the lift was made is in itself a distinctive record.

The same yard shortly before had lifted the steamer EASTERN CROSS, in 11 minutes actual pumping time, and the American army transport POWHATAN in 22 minutes. In raising the EASTERN CROSS only three sections of the 6-section dock were used, the steamer holding 4000 tons of general merchandise when she was lifted. Only four sections of the dock were required to raise the POWHATAN, weighing 12,000 tons.

The weight of the EASTERN CROSS combined with her cargo totaled close to 10,000 tons.

When the sailing ship ALEJANDRINA came to the Morse yards recently she occupied the big drydock simultaneously with a modern steamship. But 19 feet of docking space remained unoccupied as repairers worked on the ALEJANDRINA and the steamship sharing the same dock. This was a little less room than existed on another occasion when the United States shipping board steamer, LAKE FARISTON, and the YARMOUTH, first steamship of the Black Star Line Corp., composed entirely of American negroes, occupied the dock at one time.

Late Marine Patents

Copies of any of the following patents can be obtained by sending 25 cents in stamps to Siggers & Siggers, National Union Insurance building, Washington, by mentioning THE MARINE REVIEW.

1324880—Submarine battleship, August W. Cronenberg, Westport, Conn.

1324904—Torpedo guard for ships, A. C. Knapp, Victoria, Ill.

1325497—Ship locating and raising device, James Davis, Gananoque, Ont.

1325541—Method and means for destroying submarines, J. A. Steinmetz, Philadelphia.

1325542—Protecting vessels in war, Joseph A. Steinmetz, Philadelphia.

1324336.—Raising sunken ships, Joseph T. Brenneman, El Cerito, Cal.

1324425.—Salvaging apparatus, Geo. A. Long, Boston.

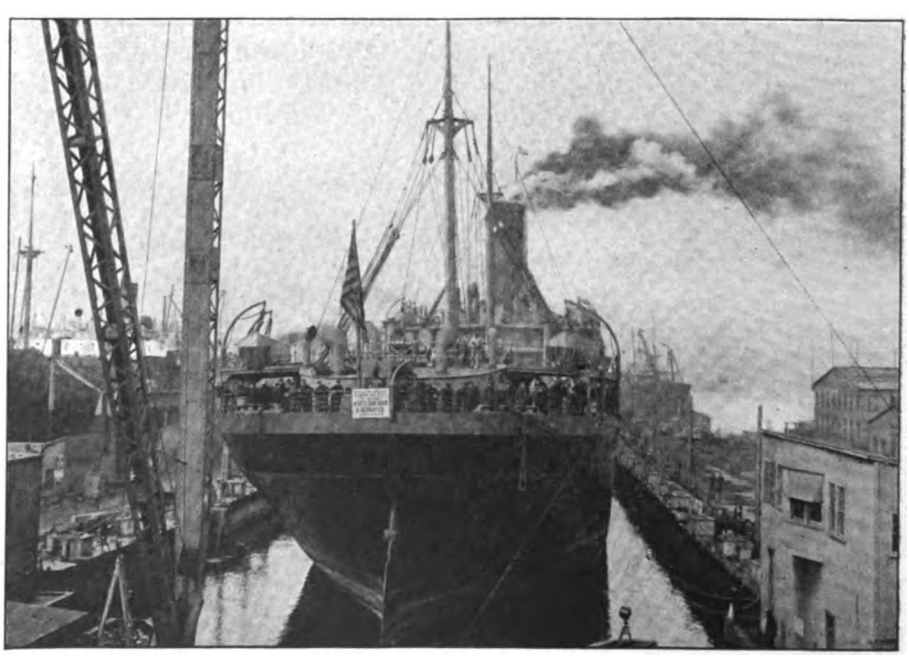
1324634.—Life-saving raft, F. Zardononi, Chicago.

1324687.—Surf board, Henry H. Newby, San Quentin, Cal.

1324722.—Submarine, William Bergin, Lewistown, Mont.

Drafting Room Aboard Ship

Aboard the U. S. S. HURON in the Brooklyn, N. Y., yards of the Morse Dry Dock & Repair Co., is a complete drafting room in which four technical men work in unison with nearly 1000 ship repairers. In this manner, one of the largest ship repair jobs ever under-



MINNESOTA, WORLD'S GREATEST CARGO CARRIER, AS SHE APPEARED IN THE DOCK JUST BEFORE PUMPING WAS BEGUN

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How to Improve Your Sextant at a Slight Expense

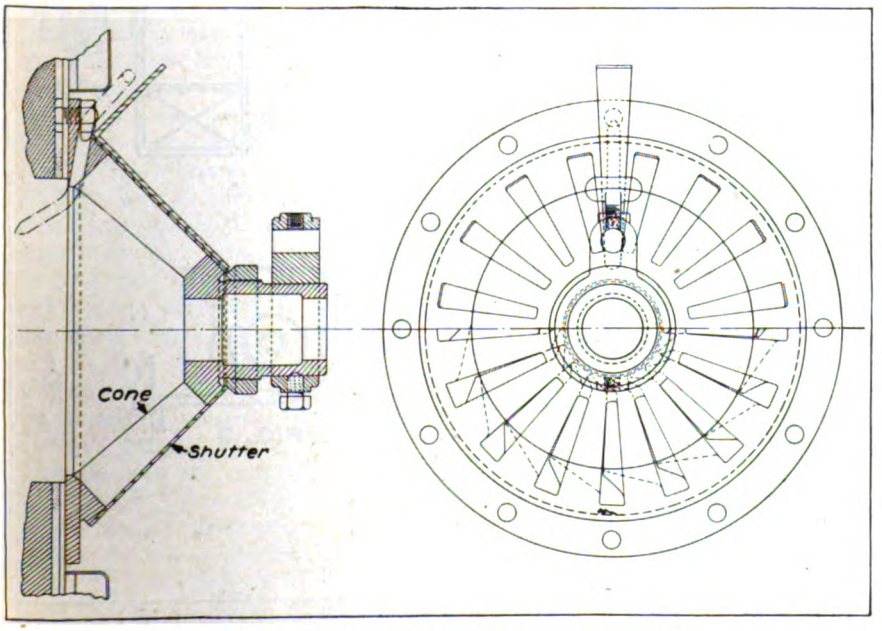
To take a correct observation calls for skill that is developed only by long practice. Anyone can learn to work out an index error and to draw down the sun correctly, but skill is required in actual practice, particularly when a huge wave comes within the line of vision to steal away the horizon. The fact that the navigator has to squint one eye, however, while looking through the telescope onto the horizon glass makes the operation more difficult. To obviate this, the navigator shown at the right has equipped his sextant with a double glass which takes the place of the single-eye telescope commonly used. Thus, both his eyes are open enabling him to secure a correct observation with little trouble. In the illustration at the left, the sextant is equipped with the usual type of telescope.

taken in America is handled with minimum loss of time.

James A. Kelly, who inaugurated the plan, is a graduate of the old school of shipbuilding. He learned his profession in the old Roach yard at Chester, Pa., and remained there for 11 years. After the Roach yard closed, Mr. Kelly spent 12 years in the scientific department of the Newport News Shipbuilding & Dry Dock Co.

Cuts 8-hour Job to 75 Seconds

Air cones are used in spraying oil for oil burning boilers and are cast iron cones with radially spaced openings. Over the cones other cones of sheet metal are placed, with similar openings which must exactly register with the openings in the castings. These sheet metal cones are called shutters and are used to restrict the flow of air through the openings in the cones proper. The accompany illustration is a plan and section of one of these cones.



OIL BURNER CONE SHUTTER PERFORATED BY STAMPING

The method of manufacturing these shutters has for years been a slow process requiring about eight hours labor to each shutter. Sheets of the desired dimensions were formed into cones and welded. The position of the openings was then laid out and the metal cut away by drilling holes at the ends of each opening and milling away the portion between. After this it was necessary to true up the holes by filing.

As this procedure calls for a large amount of hand work it is necessarily expensive. To reduce the cost of producing these shutters, Charles Williamson, who is employed at the Fore River plant of the Bethlehem Shipbuilding Corp., Quincy, Mass., devised a quicker method for machining the openings in the cones.

By the new method the cones are formed in much the same way as before but the holes are punched out in one operation. The time of manufacture has been reduced to about 1¼ minutes. The sheet metal cones or shutter blanks are slipped over a conical die, converging punches simultaneously cutting out the openings.

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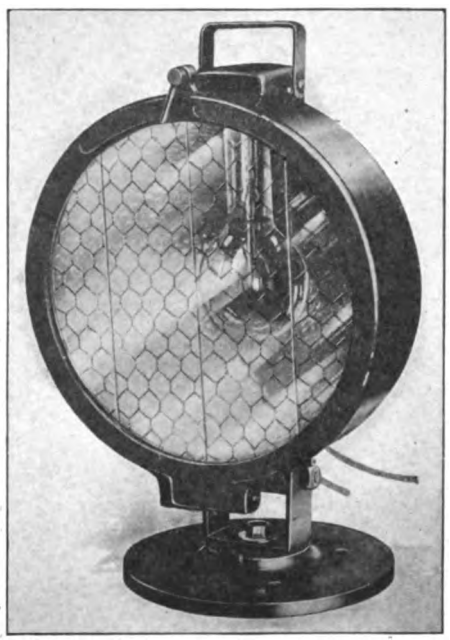
Equipment Used Afloat, Ashore

Safety Crane Brake—Portable Shipyard Light—Improved Turnbuckle—Fuel Oil Heater—Hoisting Engine—Eliminating Condenser Leakage—Cutting Hand Holds

FOR use with overhead traveling cranes, Aaron Heisler, Pittsburgh, has invented and patented a new safety device which he claims will prevent wheeled cranes or the crane structures from traveling too far upon the supporting rails. As shown in the accompanying illustrations, the safety feature is a sliding bumper which upon contact with another crane or with the end walls of the crane runway applies a brake to the motor shaft.

When the bumper strikes an object in the path of its travel, it moves a wire cable attached to a bellcrank lever, which in turn opens a valve in the air line connecting an air reservoir with a brake cylinder. A rack mounted on the piston of the brake cylinder actuates a pinion on a right and left-threaded shaft of a clasp brake on the crane motor shaft. To release the brake, air is discharged from the brake cylinder through a valve controlled by the cab operator. In order to prevent sudden shock the cable is provided with an air cushioning cylinder which tends to absorb the jar.

To apply the device to the crane, it is necessary to install an air tank and pump, piping and necessary fixtures, and a separate motor which, the inventor says, need not be of high power. Fig. 1 is a side view of the crane with the appliance attached. It shows the air tank surmounted by the motor and pump, the brake cylinder, bell crank and clasp brake. Near the top of the crane is the air cushioning cylinder and the brake wheel. Fig. 2 is an end view of the carriage showing the safety bumper and the cable attached to it. Fig. 3 shows the principle of the brake wheel which is operated by the rack on the piston rod.

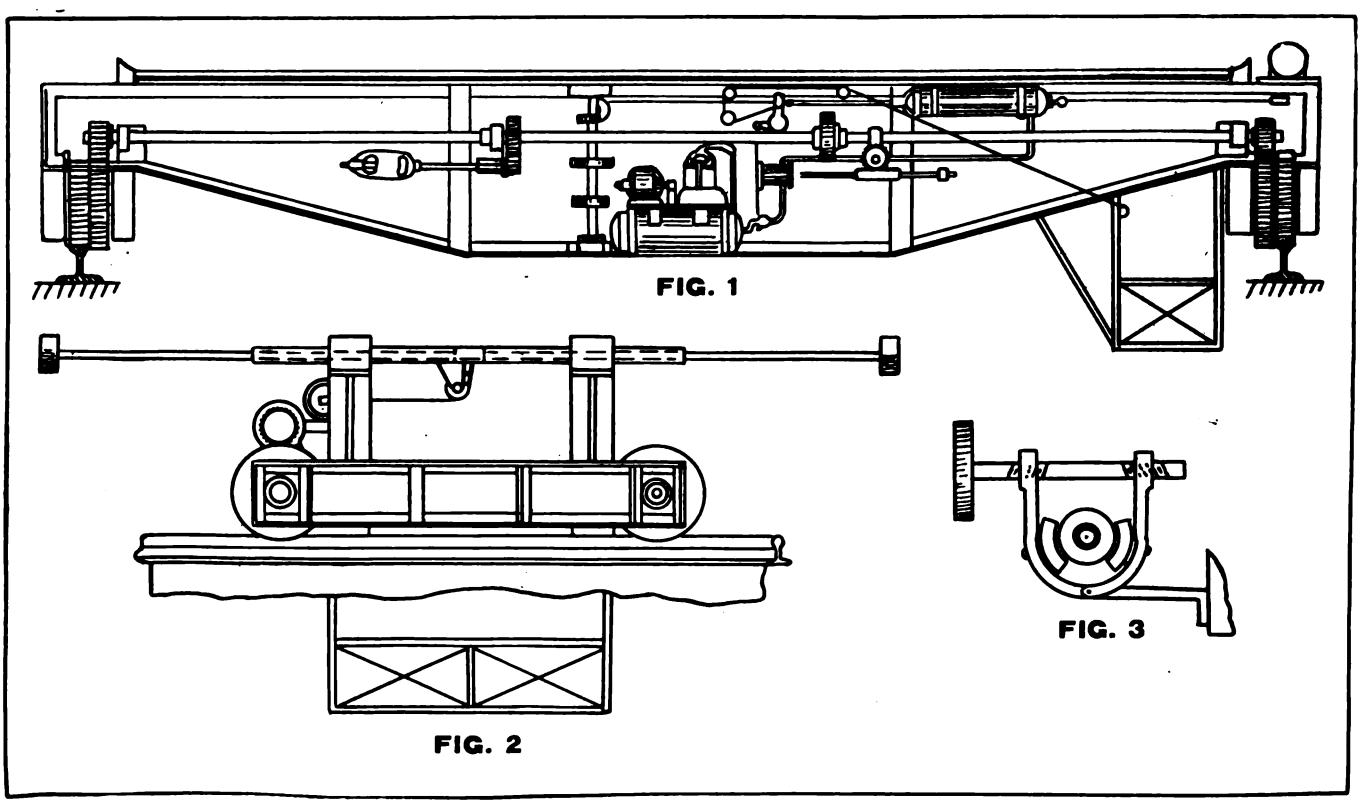


SHIPYARD UTILITY LIGHT

Portable Light

Night work about a shipyard is greatly expedited through the use of adequate lighting facilities. The light shown in the accompanying illustration recently was developed by the Western Electric Co., Chicago, for use at close ranges where the light is to be located at a distance not greater than 125 feet from the surface or object to be illuminated.

With the light operating at a 100-foot throw, it is pointed out that a 100-foot spread is obtained at a 60-degree angle. The unit is said to give a smooth, white light free from objectionable glare due to the fact that a hammered glass reflector



AIR-OPERATED DEVICE FOR PREVENTING ACCIDENTS ON OVERHEAD TRAVELING CRANES DUE TO RUNNING PAST SAFE LIMITS

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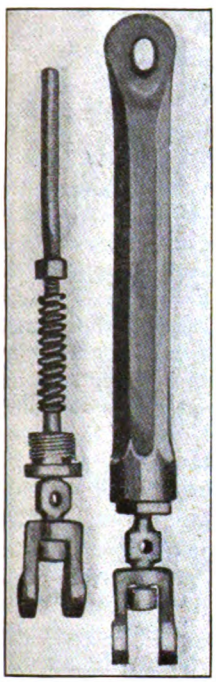
is used. Light is furnished by a 200-watt lamp.

The reflector is spring suspended in a one-piece cast iron housing. The housing is enclosed by a wire-glass front which is fitted into a recessed cast iron ring. This forms a door which is hinged at the bottom and secured by a hand latch. This, it is pointed out, affords easy access to the interior of the housing. The recessing in the ring makes the interior of the housing waterproof. The lighting unit is 19¼ inches high and weighs approximately 30 pounds. The base is 9 inches in diameter which permits the light to be readily mounted on a flat surface in a stable manner. The light can also be fastened to vertical surfaces such as walls or poles or on slanting surfaces such as roofs. This is readily accomplished by a universal joint which fastens the housing to the base.



TURNBUCKLE WITH FLEXIBLE SPRING

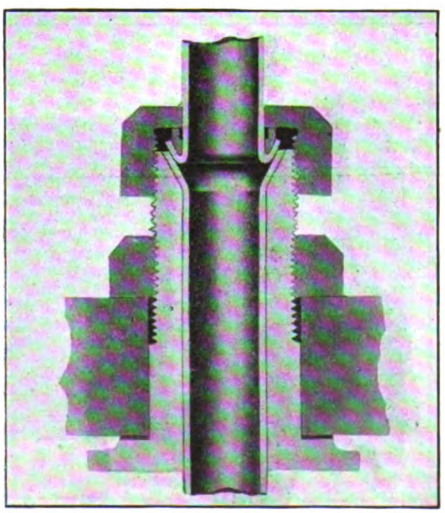
Improved Turnbuckle

The advantages of turnbuckles over old fashioned rope lanyards, rove through deadeyes, for setting up standing rigging are generally conceded. Turnbuckles possess one inherent disadvantage, however, in that the threads rapidly rust, rendering the adjustment feature of the unit useless after it has been installed for some time. Again, the ordinary turnbuckle is not flexible, which feature often causes it to part when an undue strain is thrown upon it. This feature accounts for the fact that rope lanyards are still used to some extent because they possess a certain amount of flexibility to take care of sudden strains.

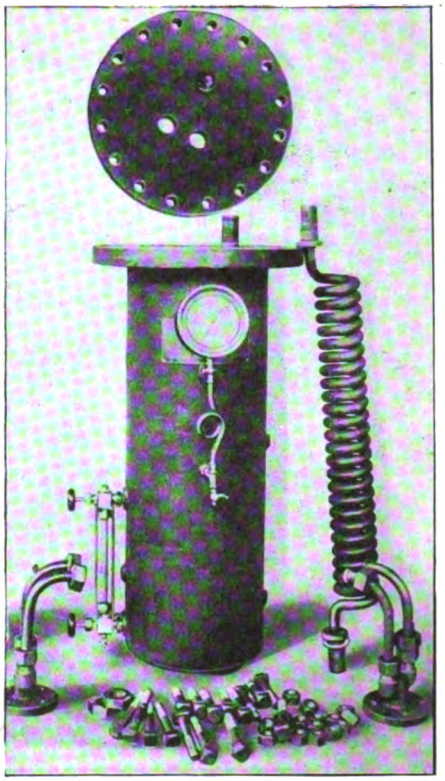
With the object of providing a turnbuckle possessing the flexibility of rope lanyards, with the ease of adjustment of the ordinary turnbuckle, the Holton-Abbott Mfg. Co., Somerville, Mass., developed the device shown in the accompanying illustration. The device consists of a hollow body, hexagonal, both inside and outside. This body is a steel casting, sufficiently annealed to insure its ability to avoid danger of fracture under sudden strains. The upper part of the body terminates in an eye as in usual practice. The lower end of the body carries a gland, threaded in place, through which passes the adjusting unit. This unit is a steel rod, threaded for several inches, carrying a hexagonal nut which is kept from turning by means of the inner hexagon of the body. Adjustment is obtained by screwing the rod into the fixed nut.

The flexible feature of the device is accomplished through the medium of a stiff spring which is interposed between the nut and the gland. In the smaller sizes, the spring is proportioned to withstand a compression pressure of several hundred pounds before the adjustment brings up solid. The limited amount of give, it is pointed out, serves as an efficient shock absorber to prevent carrying away the turnbuckle when the rigging is subjected to sudden strains, as for instance when a sailing vessel is suddenly heeled over sharply when a squall strikes her, or when the standing rigging of a steamer is subjected to unusual strains through the vessel rolling in a heavy seaway. Any man who has sailed on deep water realizes the enormous strain to which turnbuckles on backstays are often subjected. If the turnbuckles part, the spars stand an excellent chance of going by the board.

Attention is drawn to the fact that this turnbuckle is also provided with a locking device which effectually prevents the adjustment from being altered by the standing rigging slatting back and forth, due to the vessel pitching and rolling. The hollow body, which encloses the working parts, is packed with hard grease. This provides lubrication and at the same time effectually seals the parts from corrosion through the action of air and water. The upper end being permanently closed, no moisture can gain entrance at that point and as the only opening is at the bottom, through the gland, the chances of moisture gaining ingress are remote. Among the users of these turnbuckles is the Eastern Steamship lines. The company has equipped all of its vessels with this device.



CONICAL PIPE JOINT



HEATER AND COIL

Fuel Oil Heater

The apparatus shown in the accompanying illustration is an oil heater designed by the Griscom-Russell Co., New York, for heating fuel oil before it goes to the burners. Preheating of fuel oil is employed to insure proper vaporization. Thus it is apparent that the oil must be heated in the burner itself or in a heater provided for this purpose.

With the heater illustrated, the oil is pumped through coils of seamless tubing which form the heating surface. The coils are helical in shape and the arrangement is such that there are no joints within the body of the heater. It is pointed out that this feature reduces oil leaks to a minimum and prevents oil getting back into the boilers with the water from condensed steam. The coil is contained in a cast iron shell the top of which is removable for cleaning. The shell is supplied with steam at boiler pressure and is equipped with a steam and a water gage. The form

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Business Changes

Norton, Lilly & Co., New York, have moved their offices from the Produce Exchange building to 26 Beaver street.

The Fairbanks Co., Pittsburgh, is now represented in southern Ohio by A. S. Winter who formerly was advertising and sales manager for the William Powell Co.

John E. Hubbell, counselor at law and solicitor of patents, who formerly was connected with Chambers & Hubbell, Philadelphia, has opened offices at 469 Fifth avenue, New York. His practice will be devoted exclusively to patent and trade mark matters.

Callaghan, Atkinson & Co., steamship and chartering agents, 11 Broadway, New York, have opened an office at Norfolk, Va. Myron A. Varnum, port captain, is in charge.

The Black & Decker Mfg. Co., Baltimore, has opened a branch office at 6523 Euclid avenue, Cleveland, in charge of Garth A. Dodge.

Henry J. Gielow will continue in the business of naval architect, engineer, ship and yacht broker at 52 Broadway, New York, his partnership with Alexander M. Orr having been discontinued.

The FitzGerald Marine Surveying Service, Ogdensburg, N. Y., is now conducting the business formerly carried on by Richard FitzGerald who died recently.

B. W. Lougheed & Son, Inc., ship charterers, 11 Broadway, New York, will establish offices at London and Cardiff, in the near future.

The Burke Transportation Co., Inc., has opened offices at 112 Water street, Boston, to carry on a general shipping business. James J. Burke is president and general manager.

The Titusville Forge Co., Titusville, Pa., has opened a branch sales office at 433 Union arcade, Pittsburgh. C. W. Forcier is in charge.

Lexington avenue, New York, represents the company.

The Marine Mortgage Corp. recently was incorporated with $500,000 capital, by M. L. Gorty, M. C. Kelley and S. L. Mackey, Wilmington, Del.

The S. O. S. Lifeboat Co., Brooklyn, N. Y., recently was incorporated with $20,000 capital, by M. W. Wood, F. W. McCarthy and M. Tergeson, 973 Seventy-fifth street, Brooklyn, N. Y.

The Buckeye Steamship Co. recently was incorporated with $400,000 capital, by Daniel S. White, Richard C. White and Charles A. MacDonald, all of New York.

M. L. Rogers, L. A. Irwin and W. G. Singer, Wilmington, Del., were named as the incorporators of the Union Oil Steamship Co., which was recently chartered with $50,000,000 capital.

The Ovens Towboats, Inc., recently was incorporated at Wilmington, Del., with $1,000,000 capital, to build, own and operate vessels of all kinds.

The Elder Steel Steamship Co., Inc., has been incorporated at Wilmington, Del., with $3,000,000 capital, to engage in ocean commerce and navigation.

The capital stock of the Gazelle Towing Co., New York, recently was increased from $10,000 to $25,000.

The Hedenstrom Mfg. Co., New York, navigation instruments, recently was incorporated with $100,000 capital, by L. H. Healy, R. McPherson and H. L. Rhodes, 50 Broad street, New York.

Capitalized at $50,000, the Merchant Marine Steamship Corp., New York, recently was chartered to engage in transportation, trading, commerce and navigation, by A. U. Quint, A. C. Glasser and W. S. Harvey.

The International Chartering Co. has been incorporated in Delaware with 1000 shares of common stock. G. Sudman, 67 Exchange place, New York, represents the company.

Capitalized at $1,300,000, the Cuban-American Steamship Corp. recently was incorporated by O. D. Duncan, Montclair, N. J., John A. McManus and Warren C. Pye.

The Caucasus Corp., New York, shipping and forwarding, has been incorporated with $5000 active capital, by R. S. Baker, F. H. Dutehorn and R. A. McLean, 318 Seventy-fourth street, Brooklyn, N. Y.

The capital stock of the Marine-Huntoon Supply Co., Inc., New York, recently was increased from $2000 to $50,000.

The Sisterville Tank & Boiler Works, Sisterville, W. Va., contemplates the erection of a building at an estimated cost of $30,000, which will be equipped with machinery valued at $40,000.

Capitalized at $100,000, the Lookout Boiler & Mfg. Co., Chattanooga, Tenn., recently was incorporated. The company will erect a plant, 100 x 200 feet.

The Zimmerman Boiler & Tank Works, Irwin avenue, Dayton, O., is having plans prepared for erecting a 1-story plant addition.

The H. C. Doman Co., Oshkosh, Wis., manufacturer of automobile and marine gas engines, is making repairs to its plant which was recently damaged by fire. The fire started in the cupola building.

The Marine Sealing Co. of New England, Boston, has been incorporated to build ships and boilers, with $10,000 capital, by Roland V. Twombly, Medford, Mass.; Arthur Berman and C. W. Lockwood.

Britt Bros., boat builders, Lynn, Mass., are reported planning the erection of a plant.

The Marine Repair Corp., Brooklyn, N. Y., recently was incorporated with $100,000 capital, by R. Graff, J. R. Tinder and J. A. Archung, 5423 Second avenue, Brooklyn, N. Y.

The Kayenn Mfg. Co., Brooklyn, N. Y., has been incorporated to make electrical equipment with $30,000 capital, by E. R. Greenstein, E. Spector and C. H. Levitt, 51 Chambers street.

Jakobson & Peterson, shipwrights and joiners, Brooklyn, N. Y., recently were incorporated with $300,000 capital, by D. Jakobson, T. F. and L. F. Peterson Jr., 1360 East Seventh street.

The American Propeller & Mfg. Co., Covington and Gittings streets, Baltimore, is reported having plans prepared for the erection of an addition to its plant.

The Industrial Welding Corp., 207 Guilford avenue, Baltimore, recently was chartered with $5000 capital, by L. C. Geraghty and others.

J. J. Coughlan & Sons, Vancouver, B. C., have received from the Canadian government, a subsidy contract for the construction of a large drydock at Vancouver, to be built at an estimated cost of $3,750,000.

Bids closed Feb. 4 for the erection of an addition to the foundry and machine shop at the Charleston navy yard. The improvements will be built at an estimated cost of $150,000.

The plant of the DeFoe Shipbuilding Co., Saginaw, Mich., which was recently badly damaged by fire, is being repaired.

New Trade Publications

MARINE MACHINERY.—The Dake Engine Co., Grand Haven, Mich., is issuing a booklet describing its steering gears, capstans and winches. Illustrations are included, together with comprehensive descriptions of each unit. Installation diagrams are also given. The company's steering gears, it is pointed out respond readily. The capstans are equipped for both power and hand operation. With the power capstans, the engine can be installed either on deck or in the 'tween decks, just below the capstan.

CONDENSING APPARATUS.—An attractive, 115-page, illustrated catalog describing condensers in detail has just been issued by the Worthington Pump & Machinery Corp., New York. The condensers described are of two types—jet and surface. Each type is fully discussed. Several types of condenser pumps are also shown. A part of the catalog contains much useful information and tables of value to marine engineers and others interested in condensing apparatus.

WIRE ROPE.—The Durable Wire Rope Co., Boston, has issued a booklet describing wire rope for various purposes. These include hoisting rope, shovel rope, winch rope, shipper rope, towing hawsers, tiller rope and transmission rope. Full directions for splicing wire rope are given while several illustrations show the company's products in use under various conditions.

WATER HEATERS.—The Griscom-Russell Co., New York, has issued a bulletin describing its instantaneous water heater. The device is fully described and illustrated. Several tables of ratings are included together with other data of value to the engineer.

HORIZONTAL DRILLING MACHINE.—The Milwaukee Electric Crane & Mfg. Co., Milwaukee, is issuing a bulletin describing a recently developed planer-type, horizontal drill. This tool, it is pointed out, can be used to advantage on marine work. While the machine is designed to cover a wide range of drilling and boring operations, it is stated to be of especial advantage in working on pieces too bulky or long for the usual type of drill. The machine is designed to handle work of this kind at one setting. The bulletin is illustrated and describes the unit fully.

BOILER CLEANERS.—A booklet describing boiler cleaning apparatus is being issued by the Geyser Boiler Appliance Co., Detroit. The device consists of apparatus installed inside of Scotch-type marine boilers to keep the water in proper circulation. Several illustrations are included while the working principle of the unit is described in detail. It is pointed out that boilers are a perishable part of a vessel's equipment and that by proper cleaning their life may be lengthened materially. The booklet includes illustrations of several well known Great Lakes' vessels that are equipped with the company's cleaning apparatus.

MAGNESITE.—The Northwest Magnesite Co., Chewalah, Wash., has just issued a booklet describing its product which is used in making fire brick for marine installations. Much interesting information concerning this material is given while the process followed in mining and preparing it for use is described in detail.

PYROMETERS.—The Brown Instrument Co., Philadelphia, has issued an attractive catalog describing its pyrometers. The catalog contains 88 pages and 159 illustrations. The information contained on pyrometry is complete and is written in nontechnical language so that it is readily understood by the average man. For recording heat in stacks, uptakes and superheaters, it is pointed out that the pyrometer furnishes a convenient means. The instruments described are the result of many years of research work to perfect units that would prove reliable under all conditions.

HANDLING DEVICES.—A leaflet is being distributed by the W. S. Rockwell Co., New York, in which handling devices used in the heat-treatment room are described. Another leaflet issued by the company is devoted to describing and illustrating the plate and angle heating furnace equipment of a typical shipyard. Both bulletins are interesting.

TORCHES.—A 4-page folder has been published by the Mahr Mfg. Co., Minneapolis, in which torches are described and illustrated. These torches are for use in cupola lighting, ladle drying, mold drying, preheating and general foundry purposes. Any length of flame, ranging from a few inches to five feet, can be obtained. The torches operate on compressed air at any pressure, and burn light fuel oil or kerosene.

AIR-LIFT PUMPING.—A bulletin which calls attention to air-lift pumping, is being circulated by the Union Steam Pump Co., Battle Creek, Mich. This system consists of lifting water by means of compressed air, and is generally employed where conditions are such that it is impractical to use a mechanical pump. The booklet goes into the subject in detail, and a number of illustrations are given.

STEEL FORMS.—An illustrated folder has been published by the Blaw-Knox Co., Pittsburgh, in which steel forms for concrete construction of all kinds, are described and illustrated. The illustrations show the various work on which these forms can be used to advantage.

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